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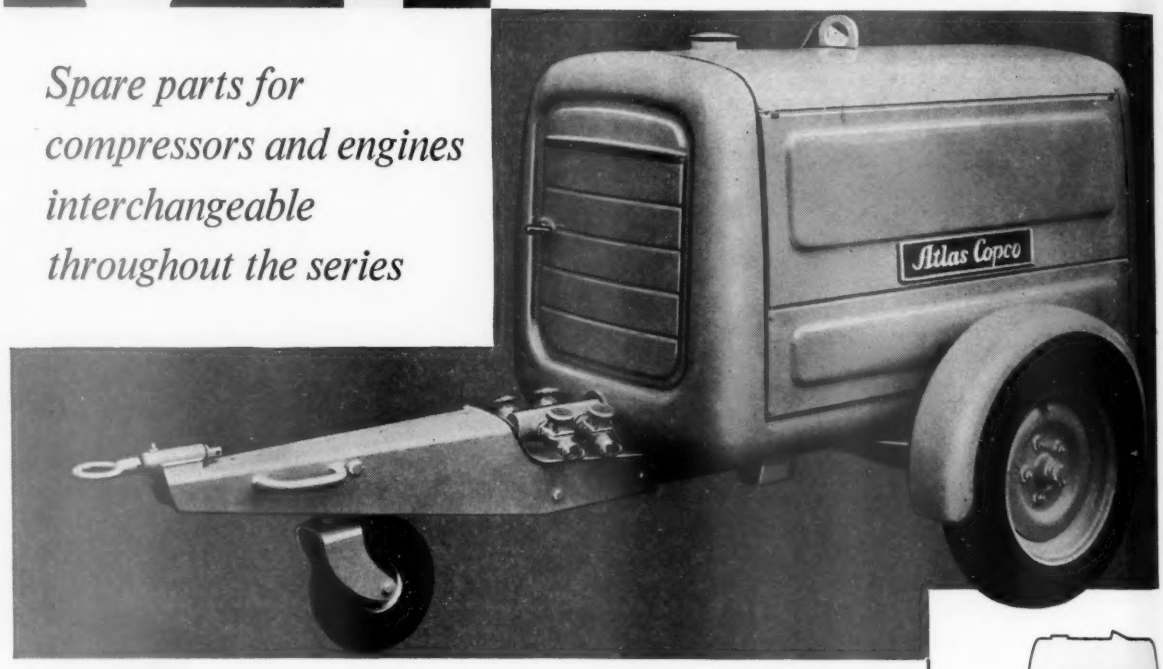


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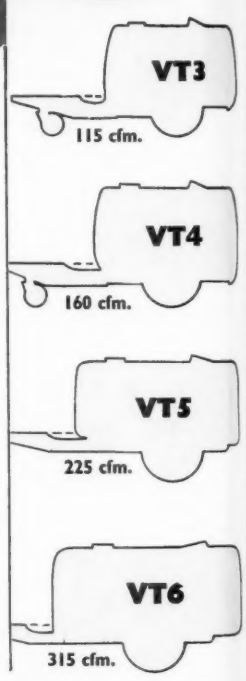


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*An index to the 109th volume of* THE RAILWAY GAZETTE, *covering the issues from July 4 to December 26, 1958, has been prepared, and is now available free of charge on application to the publisher.*

## An Unhelpful N.U.R. Decision

SOME of the disadvantages of the form of trade union democracy inherent in the National Union of Railwaymen's constitution are being demonstrated at a particularly unfortunate time for all parties. The leaders of that union are being pushed into a wage claim by their branches; now the executive has informed the British Transport Commission that it wishes to withdraw from the railway consultative machinery as from June next. This has been done because the B.T.C. has refused to accept the principle of a closed shop in certain sections of the organisation. There is reason to believe that not all the members of the union executive are in favour of the step which has been taken—or indeed are convinced of the wisdom of the timing of the wage claim—and this fresh instance of the growing custom of the tail wagging the dog must be causing concern at the N.U.R. headquarters. Sir Brian Robertson, Chairman of the Commission, has told the N.U.R. bluntly that the B.T.C. is astonished by the latest threat and that it deplores it. He has frequently gone out of his way publicly to acknowledge the help received from the unions and the importance he attaches to their co-operation. In any case, the agreement on consultative procedure requires joint notice of termination by all three railway unions and 12 months' notice must be given. In his letter Sir Brian Robertson points out that British Railways are going through a major crisis to which neither management nor unions should close their eyes. The basic object of both was the industry's prosperity and nothing should be done to undermine public confidence or imperil the future of the industry. Co-operation and fruitful consultation could not be enforced by agreement, but he hopes these wider considerations will influence the N.U.R. executive to reconsider its decision. This letter is to be laid before the next meeting of the executive and should give some support to the views of the more moderate members. They appreciate that the unions have far more to lose than has the B.T.C. by the implementation of the present threat.

## Better Employment Figures

A GRATIFYING decline in the unemployment figures was announced by the Minister of Labour in the House of Commons last week. The unemployment percentage in Great Britain fell in March to 2·5 as compared with 2·8 in February, and was the largest decline to be recorded in any month since 1947. It was particularly satisfactory to have the assurance that there had been a substantial decrease in every region in England, Wales, Scotland and Northern Ireland and that it was widespread over the main and key sectors of industry. The Minister emphasised that the general fall, which was 58,000 to give a total of 550,000 unemployed compared with 608,000 in the previous month, could not be explained by anything except a genuine revival of demand. He also stated that the improvement was three times greater than could be contributed to seasonal factors and was concentrated among the wholly unemployed in which category the total had dropped by 48,000 persons. As might be expected because of better weather conditions, there was a big drop in unemployment in building and contracting, but it is noteworthy that the total unemployment in the engineering industries had declined by over 4,000.

## Re-Nationalisation of Steel

THE Labour Party has re-affirmed its intention of re-nationalising the steel industry if it is returned to power. In a Party pamphlet "Steel and the Nation," by Mr. Hilary Marquand, M.P., published last week, it is stated that "fair compensation" was paid when the industry was nationalised under the Labour administration of 1945-50 and that "similar fair treatment" will be given again. The declaration hints that nationalisation will again be by statute, and not by gradual acquisition of steel companies' shares. It praises the British Iron & Steel Corporation set up by Labour in 1950, and declares that a similar flexible structure will be established again. The system of supervision through the Iron & Steel Board, Mr. Marquand alleges, is "inadequate and feeble," as control is divided between five "power centres": the Board, the Iron & Steel Holding & Realisation Agency, the British Iron & Steel Federation, the steel companies and the Minister of Power. For Labour not to advocate the return of the industry to national ownership, he adds, would be to perpetuate "a muddle." There are no grounds for this criticism of an industry which is particularly well organised. Apart from the disturbance which would be caused, re-nationalisation of the steel industry would be most undesirable interference with efficient free enterprise.

## Overseas Railway Traffics

RAILWAY operating revenues of the International Railways of Central America for January amounted to $1,383,248, compared with $1,404,265 in January, 1958, a decrease of $21,107. The net revenue from railway operation was $225,517 ($159,788) and the net income $98,732 ($58,220). Costa Rica Railway receipts for February amounted to colones 2,293,928, compared with colones 1,910,126 in February, 1958, an increase of colones 383,802. Aggregate receipts from July 1, 1958, to February 28, 1959, totalled colones 15,533,821, compared with colones 14,516,464 in the corresponding period of 1957-58. Salvador Railway Company receipts for January amounted to colones 333,000, compared with colones 258,000 in January, 1958. The aggregate receipts from July 1, 1958, amounted to colones 1,646,000 (colones 1,519,000). Net railway earnings of the West of India Portuguese Guaranteed Railway Co. Ltd. showed some slight improvement during February in comparison with previous months, although returns for both coaching and goods traffic were below those of 1958. The improvement is mainly attributable to better goods receipts. Figures received from the Midland Railway Company of Western Australia Limited show that estimated road and railway receipts for December, 1958, were £A69,322 (against £A64,970 in December, 1957).

## Vulcan Foundry Products

THE confidence of the British Transport Commission in English Electric products, exemplified in orders for diesel-electric and a.c. electric locomotives for British Railways, was mentioned last week by the Chairman, Sir George H. Nelson, at the annual general meeting of the Vulcan Foundry Limited. The latter firm, with Robert Stephenson & Hawthorns Limited, supplies the mechanical parts and erects and tests the locomotives, production of which is under the general direction of the parent company, the English Electric Co. Ltd. A notable product is the 3,300-h.p. diesel-electric design with Napier Deltic diesel engines, 22 of which are under construction for British Railways, Eastern Region. Production for overseas at the Vulcan works last year included locomotives for Rhodesia, South Africa, and Spain, and Robert Stephenson was constructing for the Argentine and Malayan railways. During the current year, besides continuation of some of these orders, the programme includes locomotives for East Africa and the Sudan. Sir George Nelson has pointed out that export orders are becoming increasingly difficult to obtain in the face of very keen competition in other countries. This demands minimum production costs in the minimum time, so that the tenders may be competitive in price and delivery. The success achieved by the English Electric Traction Group is shown by the diesel-electric locomotive order recently received from the Sudan Railways against the competition of 22 other firms, representing 11 countries.

## Institute of Transport Annual Dinner

THE part played by the Institute of Transport in training future leaders was stressed by Major-General G. N. Russell, President of the Institute, at the annual dinner last Friday at the Dorchester Hotel, London. The instruction, lectures, and discussion on transport subjects obtainable through the Institute, he pointed out, helped to equip with knowledge the younger men who as leaders must solve the problems of the future. He was disappointed at the poor attendance at some of the meetings. The President for 1959-60, he announced, would be Mr. R. G. Grout, Chairman & Managing Director of the General Steam Navigation Co. Ltd. Like the late Mr. Robert Kelso, a former Chairman of General Steam Navigation, who was President in 1944-45, Mr. Grout for several years has given his services to the Institute as Member of Council and of various committees, and in presenting papers. Viscount Simon, Chairman of the Port of London Authority and lately a Deputy Chairman of the Peninsular & Oriental Steam Navigation Co. Ltd., reminded his audience that the Institute was 40 years old, that it had founded, and was still founding, branches overseas, and that it could play an important part in fostering co-operation between varying modes of transport. An enjoyable feature of the Institute annual dinner is the opportunity for providers of different modes of transport to renew friendships and exchange ideas.

## British Transport Commission C.I.D.

CONCERN over the increase in crime in this country is not restricted to the civil police. The British Transport Commission is equally aware of the importance of crime detection; a fact borne out by the formation of a Criminal Investigation Department, as part of the re-organisation of its police force. Under Mr. A. C. West, Chief Constable since last May, two senior officers have been appointed to the new department. Mr. W. O. Gay, who as recorded elsewhere in this issue, becomes Chief of Police (Crime), will be responsible to Mr. West for the selection, organisation, training and general direction of the C.I.D. staff, throughout the Divisions of the Force, in conjunction with the Area Chiefs of Police. Under the new organisation it is evident that the Criminal Investigation Department will be able to concentrate on the more serious offences, with a thoroughness which these cases merit. The uniformed branch will be relieved of a great deal of work, and, in consequence, it will be better able to carry out its day to day duties which are none the less important.

## Smoking in Trains

MORE non-smoking compartments in Underground trains are likely to be provided by London Transport Executive as a result of research into travellers' habits. Dr. L. G. Norman, Chief Medical Officer of the Executive, stated recently that the preliminary findings of an investigation suggested that a maximum of about 30 per cent of passengers smoked during their journeys. If that result were confirmed by further observations, 50 per cent of non-smoking carriages ought to suffice for smokers and non-smokers. He believed that public opinion would harden against smoking to the point of a total ban on smoking on the Underground, as in other countries. About 15-20 per cent of compartments and saloons on British Railways are understood to be non-smoking. We agree with Dr. Norman that it is not the duty of a public transport operator to prohibit those who wish to smoke from doing so, in the proper place, even although they may thereby impair their own health. Such prohibition may be justified if it can be shown that tobacco smoke harms others besides the smoker. There is little evidence of this. It is important to safeguard the amenities of railway travel by enforcing the prohibition on smoking in non-smoking accommodation. In that respect British Railways are thought by many to be less assiduous than some railways overseas.

## Locomotive Engineers Visit Derby

THE production and testing of main-line diesel-electric locomotives probably aroused the most interest among the many items inspected by members of the Institution of Locomotive Engineers who visited the Derby Locomotive Works of British Railways, London Midland Region, last week. The party of over 200 included Mr. R. Arbuthnott, President of the Institution, Mr. D. C. Brown, Vice-President, several Past Presidents, and many others prominent in the world of locomotive engineering. A brief description is given elsewhere in this issue. The visitors were shown inter alia the fabrication on jigs and assembly of the Type "2" 1,160-h.p. and the Type "4" 2,300-h.p. main-line diesel-electric locomotives. In the diesel test house they inspected the running-up before full-load testing of the power plant installed in a Type "2" locomotive. The new Merlin Calimaster calibrat-

ing and phasing machine for diesel fuel injection pumps were demonstrated in an annexe to the diesel engine repair shop. In the School of Transport instituted by the L.M.S.R. in 1937-38, many working examples seen included diesel engines and transmission systems, also demonstration rigs, designed to simplify the teaching of electrical control principles and fault-finding.

### London to Paris Rail-Air-Rail Service

CHEAPNESS, a reasonable overall journey time, and a short air journey are combined in the "Silver Arrow" rail-and-air service which begins in June between London and Paris via Manston (Thanet) and Le Touquet airfields. Some details are given elsewhere in this issue. Advantage is being taken of electrification of the Kent Coast line of British Railways to convey passengers by multiple-unit train between Victoria and Margate. This is the first time that conveyance by a British Railways train is included in a rail-and-air service via Le Touquet. In previous years, the French National Railways ran a railcar between Etaples and Paris Nord, but travel between London and Ferryfield airport was by road. The London-Paris return fare of £8 19s. compares favourably with air fares via London and Orly (Paris) airports. The journey time of 7 hr. is not excessive, and the short duration (30 min.) of the flight will appeal to many travellers. The disadvantages of transhipment will be reduced if it is found economic to build lines to serve Manston and Le Touquet airfields.

### Isle of Man Railway Company in 1958

DESPITE the difficulties of the 1958 holiday season, which were apparent not only in the Isle of Man, but in British resorts generally, the fewer visitors, and the unsettled weather, it is noteworthy that passenger traffic of the 3-ft. gauge Isle of Man Railway Company showed a decrease of only 1·8 per cent in 1958. Mr. A. C. Teare, Chairman, stated at the annual general meeting on March 11, that total receipts amounted to £81,885, expenses to £77,310, and the net receipts £4,575. Compared with 1957, these results show a decrease of £4,715 in receipts and a saving of £2,275 in expenses, the net receipts being less by £2,440. Of the decrease in receipts about half is accounted for in goods traffic, because a greater quantity of sand and gravel was conveyed for special work in 1957. The remainder is divided equally between passengers and parcels. With many counter-attractions to home resorts being offered on the Continent, competition is keener each year, and the I.M.R. will have to exert all its energies to attract passenger traffic. The majority of visitors stay in Douglas and use the railway for excursions.

### A Missing Van

THE collision near Lunan Bay on September 2, 1958, arose from a combination of failures on the part of several men, who either did not obey simple regulations or exercise a little thought when stopped by an automatic brake application. As will be seen from our summary of Colonel D. McMullen's report, the guard and fireman failed to realise that something had become detached, while the driver did not act intelligently on the information given to him. In addition, a signalman failed to notice the absence of the tail lamp and accepted the following train, whose driver had no chance of avoiding the collision. Other violations of block regulations were committed. The driver of the first train should have been informed at Dundee, where his engine came on, that short-wheelbase vehicles were attached, requiring him not to exceed 60 m.p.h. anywhere, but the arrangements there for doing so were unsatisfactory and called for review. Colonel McMullen considers that the van became derailed —after which it was dragged two miles—from excessive speed, not less than 70 m.p.h., combined with slight track imperfections and perhaps some small maladjustment of springs. Insufficient knowledge of speed limits by footplate staff was revealed by his inquiry.

## Proposed New Trunk Railway in Japan

THE 310-mile standard-gauge line between Tokyo and Osaka, construction of which is being actively considered by the Japanese Government, is the most ambitious railway building scheme of its kind proposed in any country for many years. Its most notable feature is choice of the 4 ft. 8½ in. gauge, instead of the existing 3 ft. 6 in. gauge of the Japanese National Railways. Advantage is to be taken of the standard gauge to operate passenger trains at a maximum speed of 155 m.p.h., and the loading gauge will allow of "piggy-back" transport of loaded road vehicles on flat wagons. The new line will be roughly parallel to the present 3-ft. 6-in. gauge line.

The existing Tokaido Line (Tokyo-Kobe) of the Japanese National Railways is the most important line in Japan, linking more than 40 cities, including industrial zones such as the Tokyo-Yokohama, Nagoya, and Osaka-Kobe areas. The length of the line is 367 miles, or 2·9 per cent of the total route-mileage of the J.N.R. More than 36,000,000 people, around 40 per cent of the total population of the country, live along the line. For density of population the areas along this railway line are believed to be unparalleled in the world. The manufacturing output of the industrial zones constitute more than 60 per cent of national production. Traffic on the Tokaido Line is heavy, it accounts for about 24 per cent of the total passenger and about 23 per cent of the total goods tonnage. From 60 to 80 passenger and from 50 to 60 goods trains are run each way daily, and traffic is increasing. Measures to augment capacity include electrification of the entire line, completed in 1956. With 120 trains each way daily the double-track line is now near saturation. In planning further measures, consideration has been given to the effects of building a trunk road and of the development of sea and air transport. In general it is felt that none of these will attract a large volume of traffic away from the railway. The fact that much of the freight moved by rail is primary products such as coal, timber, and gravel, which will not bear high rates, is in favour of rail transport. If the present rating structure remains as at present, which is thought probable, coastal shipping will not affect railway freight traffic adversely. Development of air transport is unlikely to cause a reduction in railway passenger traffic, because of the necessarily high air fares and restricted public spending power.

Apart from its greater capacity, the adoption of standard gauge will result in economies. The cost per mile of building the wider gauge is higher, but there will be no necessity for connections with existing lines. It will be possible to electrify at a.c., with consequent savings in installation costs, from the outset, because there will be no physical connections with the d.c. electrification on the 3-ft. 6-in. gauge. On the projected line passenger trains will be able to cover the distance between Tokyo and Osaka in 3 hr. and express goods trains in 5½ hr. The fastest passenger and freight trains on the present Tokaido Line require 6 hr. 50 min. and 11 hr. 30 min. respectively for the 344 miles between Tokyo and Osaka. To ensure safety in high-speed operation there will be no level crossings. Passenger trains will be multiple-unit. Goods trains will be hauled by electric locomotives. The minimum radius of curves is to be 124 ch. and the maximum gradient 1 in 100. Cooper's standard loading is to be adopted. There will be as few intermediate stations as possible, and only where it will be possible for a large volume of passenger and/or freight traffic to flow from the existing to the new line. The total cost involved will be around £170 million, including rolling stock cost. It is hoped to complete the construction work of the new line by 1961 or 1962 when the present Tokaido Line will be unable to move more traffic. Construction of tunnels, including the new Tanna tunnel, 5 miles long, and acquisition of about 62 miles of right-of-way in and around large cities will commence from the first year.

The basic fares and rates on the new line are to be the same as for 3-ft. 6-in. gauge line. Supplements for express passenger trains will probably be higher than at present. For door-to-door "piggy-back" traffic, charges will be

adjusted so as not to exceed the present charges for door-to-door transport including trans-shipment.

The financial problem lies in the redemption of the principal and interest. Supposing that the J.N.R. builds the new line entirely with borrowed funds, that the rate of interest is 7 per cent per annum, and that the loan will remain unredeemed during the period of construction and then will become redeemable in 15-year equal instalments after the line opened to traffic, the estimated balance between revenue and expense is favourable and it will be possible to redeem the principal and interest. For a few years after the opening of the line, the J.N.R. whose management depends much on net profits from the Tokaido Line, will experience some difficulty in paying its way, because the net receipts from operation of the two lines, old and new, will decline under the weight of load redemption. The Trunk Line Survey Committee has recommended that the J.N.R. should not attempt to tide over this temporary financial difficulty by raising fares and rates, but try to solve the problem through other financial means, namely, by building up its own resources and covering shortages by Government and foreign loans.

## Signalling in America in 1958

NEW signalling work on the U.S.A. railways suffered a decline in 1958, manifested in most classes of equipment except automatic signalling and automatic interlocking or control of movements where two railways cross on the level, frequently met with in America. It was mainly at such locations that most interlocking installations were provided on some railways, but the frequency of movements often was such as to render continuous staffing of signalboxes, at times situated in remote places, very costly, and means of achieving like results automatically found ready favour.

The prospect of improved railway revenues in the present year is likely to be reflected in a renewal of activity in signalling work. Adequate equipment, with diesel traction, is recognised as one of the principal aids to reducing operating costs. C.T.C. was installed on 1,086 route miles. Of these 964 were single line and included the longest continuous length of 139 miles. The remaining mileage included cases of reduction in the number of running lines and the introduction of reversible working with double crossovers at regular intervals. In one case lengths of double line have been singled, leaving the remaining double line sections, equipped for reversible working with crossovers, to cover all crossing and overtaking movements. Ordinary automatic signalling was extended to 229 route miles and included some close headway installations on city lines in New York and Chicago. Forty-four signalboxes were rebuilt, one with 131 points and signals, and 24 new ones opened, though none was of any size. The automatic railway level crossing installations comprised 19 new, with 27 rebuilt.

A less costly type of C.T.C., in which only one end of a crossing loop is power operated has given good results, and several lines are considering applying it on lightly trafficked sections. The use of spring switches and automatic facing point locks was again extended. Ten new gravity marshalling yards were opened and older ones improved, enabling earlier types to be closed and economies to be effected.

Road level crossing protection by flashing lights was provided at 961 places, and with automatic barriers in addition at 419. Of these 1,380 installations 423 were paid for by the railways, 127 by public authorities and the remainder jointly. Electronic apparatus is now being used in the control of the warning apparatus. Figures for 1958 are not yet available, but in 1957 there were 3,569 accidents at road crossings in which 1,371 persons were killed and 3,767 injured.

Although not forming part of signalling in the usual sense the hot axlebox detector may be mentioned as finding increasing application, with the dragging equipment detector, and as having often prevented what might have been serious derailments with possible casualties and certainly much damage. Figures of signal failures for the year ended June 30, 1958, show that for some years the use of more equipment has been accompanied by a general decline. This shows improved maintenance and better designs of apparatus. In the period mentioned 72 false clear failures were recorded with 16 potential cases, against 74 and 12 in the previous year, with 25,299 safety side failures against 28,065: over half the false clears arose from sand, dirt or rust on rails, open or crossed circuits or extraneous current; the rest were attributable to weather conditions, lightning and so on, breakage of parts, or wiring mistakes. The greater number of safety side failures occurred in automatic signalling territory. Of the 37 collisions inquired into, 24 occurred on lines using some form of block signalling, and 11 arose from neglect to observe signals. Mistakes in the issue of train orders accounted for two only.

A feature of American signal engineering of recent years has been the adaptation of well established principles to changing conditions to effect economies in the operation of the lines, a process aided largely by developments in circuit technique and the application of electronic devices to signalling controls.

## Improvement Plans in Italy

MOTIVE power and rolling stock are the principal items of expenditure in an £8,000,000 improvement scheme for the Italian State Railways recently sanctioned by the Minister of Transport, Signor Armando Agelini. Many passenger stations in Italy have been reconstructed or improved since the war of 1940-45, largely as a result of war damage. Only two stations figure in the new plan. Sassari, in northern Sardinia, is to be modernised, as part of the project to improve the railways in that island, and a wayside station between Catania and Syracuse is to be enlarged in connection with the Messina-Syracuse electrification. Other civil engineering works include strengthening of bridges to bear the heavier loads consequent on electrification, and welding of rails on the Venice-Udine (-Vienna) main line. Some steam running sheds are to be converted for electric locomotives and multiple-unit trains. In Calabria, in the extreme south of the Italian mainland, houses are to be built for railway staff in districts lacking good housing and amenities. This appears to be one of the measures being taken to improve the efficiency of the lines in the south generally, especially the main line between Naples and Sicily via the Straits of Messina train ferry. Both goods and passenger traffic with Sicily has much increased in the last few years. The former includes citrus fruit moved by fast trains to Germany, Belgium, France, Britain (by train ferry) and other countries. Tourist traffic is still growing.

About two-thirds of the expenditure is on purchase of 47 electric locomotives, 20 multiple-unit suburban train sets, and 10 railcars and trailers. All, it is understood, are to work on the lines electrified at 3,000 V. d.c. The mileage on this system is being gradually increased as sections are converted to 3,000 V. from their original three-phase working. No provision seems to have been made in the latest improvement plan for new diesel trains or railcars.

Electrification of 720 route-miles is already in progress, out of 807 to be converted under the five-year programme initiated in 1958. When this has been implemented, nearly 5,000 route-miles, of which half are doubletrack, including all main lines, will have been electrified of the State Railways total route-mileage of 10,370. Among sections being converted are the main line from Milan to Turin. Electrification from Mestre (Venice) to Udine will afford electric working between Sicily and Vienna when electrification of the Südbahn of the Austrian Federal Railways is finished. Conversion between Mestre and Cervignano, on the Venice-Trieste main line, on the route of the "Simplon-Orient Express," will result in electric traction, at various voltages, between Paris and Ljubljana, in Yugoslavia, via Lausanne, Milan, Venice, and Trieste. Various other sections are being converted in the north. A further section, from Ancona to Pescara, is being electrified of the

main line along the Adriatic coast. Work is well in hand on the Messina-Syracuse line. The cost of these projects is stated to be nearly £46 million, including strengthening of bridges and reconstruction of tunnels. In addition, nearly £10 million is being spent on a new power station near Monastero sull'Adda, in the Alps north-east of Milan. Orders have been placed with Italian builders for motive power and rolling stock to the value of £15 million. They cover more than 150 locomotives, 100 railcars or trailers, four four-car *elettrotreni* (multiple-unit trains) of the " ETR-250 " type, and a seven-car luxury *elettrotreni* of the " Settebello " type to make the third set of this type to operate the Rome-Florence-Milan high-speed service. The latter apparently is remunerative, though the passenger complement of the seven-car set is small.

## Ulster Transport in 1957-58

THE 10th annual report of the Ulster Transport Authority, signed by Mr. G. B. Howden, the Chairman, and Mr. J. Sydney Rodgers, a Member of the Authority, covers the year ended September 30, 1958. It shows a net deficiency of £61,330 on the year's workings, compared with a surplus of £93,772 in 1956-57. The trading balance was £147,479, a reduction of £154,886 on the previous year, but £208,809 was required for loan interest and capital redemption charges. The accumulated deficiency brought forward from 1956-57 amounted to £2,400,453, and there is now a deficiency for the 10 years to date of £2,461,783.

Some of the principal results for the past three years are given below:—

| | 1956 | 1957 | 1958 |
|---|---|---|---|
| | £ | £ | £ |
| Railway passenger traffic .. .. | 687,305 | 773,544 | 756,126 |
| Rails and road freight traffic .. .. | 1,931,402 | 2,105,491 | 2,119,084 |
| Parcels, luggage, etc. .. .. .. | 264,050 | 307,295 | 316,720 |
| Bus service .. .. .. .. | 3,337,921 | 3,626,768 | 3,681,125 |
| Hotels and catering .. .. .. | 482,871 | 490,898 | 516,075 |
| Revenue .. .. .. .. .. | 6,748,795 | 7,357,328 | 7,452,910 |
| Expenditure .. .. .. .. | 6,860,010 | 7,054,963 | 7,305,431 |
| Net operating revenue .. .. .. | —111,215 | 302,365 | 147,479 |
| Miles of railway open .. .. .. | 277 | 277 | 268 |
| Route mileage, buses .. .. .. | 2,670 | 2,620 | 2,707 |

Passenger train services were operated throughout the year over 134 of the 167 route-miles of railway open for traffic. The remaining 33 miles were used only for freight services. Passenger train-miles increased by 63,751 from the previous year to 1,561,712, but passenger train journeys fell by 718,801 to 6,897,090. The increased mileage was due to the introduction of shorter trains and increased frequency of service in connection with the programme of conversion to diesel traction. Freight train mileage amounted to 146,526, a decrease of 14,674, and 218,327 tons of merchandise were conveyed, a decrease of 64,122 tons. Virtually no livestock passed by rail.

On February 3, 1958, a new type of diesel train was brought into service on the line between Belfast and Londonderry. Two five-car trains, constructed in the Authority's workshops, provide a fast service between the two cities, as well as serving the principal intermediate stations. Each train makes two return trips every weekday; the booked time for the journey varys from 1 hr. 50 min. to 2 hr., a reduction of 20 min. compared with the former steam train service. Three train sets were formerly required for steam working because only one double journey a day could be worked by each set.

On October 1, 1957, all passenger and freight services were withdrawn by the Great Northern Railway Board from the lines between Omagh and Newtonbutler, via Enniskillen; Bundoran Junction and Belleek; and Portadown and Tynan, via Armagh, these being the Northern Ireland sections of cross-border lines to Dundalk, Bundoran, and Cavan respectively. As a consequence through services also ceased to operate, although freight train services over certain sections in the Republic of Ireland were continued by the Board. To cater for the traffic displaced by these withdrawals of rail services appropriate road services have been provided by the Authority.

The Sligo, Leitrim & Northern Counties Railway, operating between Enniskillen and Sligo, was also closed on October 1, 1957, and it was agreed between the Authority and Coras Iompair Eireann that the latter would provide the necessary alternative road services, which in Northern Ireland operate between Enniskillen and Belcoo.

No sections of U.T.A. railway line were closed during the year. The total length of track closed since the U.T.A. was established in 1948 amounts to 158 miles. The track sites have now been sold except for 2½ miles retained for other purposes and about seven miles on which negotiations for sale are proceeding.

The Transport Act (Northern Ireland), 1958, was passed during the year, and changes affecting the functions and responsibilities of the Authority were made in consequence. Under section 18 the U.T.A. is required to secure financial equilibrium as soon as possible, and not later than September 30, 1964, and to maintain it thereafter.

## Indian Railways' Budget, 1959-60

(*By a correspondent*)

PRESENTATION of the Railway Budget to the Indian Parliament early in the year is a useful opportunity for reviewing the progress of the railways. The Minister for Railways, Mr. Jagjivan Ram, in his recent Budget speech, was hopeful as regards their performance during 1958-59 and their financial prospects in 1959-60. There was no longer, he stated, a serious shortage of materials or extensive backlog of rehabilitation work. There were grounds for optimism in the handsome net surplus for the financial year which has just closed, and in the railways' ability to handle increasing quantities of goods traffic generated by steady industrial progress.

Indian railways received considerable financial assistance from the World Bank during the last two years. This has been used for renewals and for creating additional capacity to handle increased traffic. During 1956-57, the first year of the second Five-Year Plan, the total tonnage moved was 124 million, against 114 million in 1955-56, an increase of nearly 9 per cent. In 1957-58, the tonnage moved to 132 million, an increase of 6·5 per cent over 1956-57. During 1958-59, the further increase in traffic is not likely to be more than 5 million tons, as against the expected increase of 12 million tons over 1957-58. Except for coal traffic, the rise in goods traffic generally has been much less than was hoped, and there was a drop in movements of agricultural products. During 1959-60, Mr. Ram has announced, the expectation is that with the steel mills at Bhilai and Rourkela, which went into production of pig iron in February last, and the one at Durgapur going into production in a few months' time, the total goods tonnage will rise to 151 million. The railways will then be well on the way to achieving the target of 168 million tons, set for the second Five-Year Plan. The financial assistance from external source is likely to continue. Already loans of $20 million from the U.S.A. and $8 million from Japan have become available for building new lines for transport of iron ore from Orissa.

The Budget speech showed that during 1957-58 the actual gross traffic receipts were Rs.379·78 crores, against the revised estimates of Rs.384·40 crores, a shortfall of Rs.4·62 crores, for both passenger and goods traffic. There was a marked decline in traffic from about the middle of January, 1958. The ordinary working expenses showed an increase of Rs.5·02 crores over the revised estimates of Rs.259·16 crores, largely under the heads of repairs and maintenance expenditure, which included expenditure on safety measures to minimise accidents. After allowing for other smaller variations, the net surplus came to Rs.13·38 crores, against the revised estimated figure of Rs.21·66 crores. The entire surplus was credited to the Development Fund. Gross traffic receipts for 1958-59 were estimated at Rs.394·38 crores, a shortfall of Rs.13·10 crores, compared with the Budget estimates. The revised ordinary working expenses were estimated at Rs.274·22 crores, an increase of Rs.5·87 crores over

the Budget estimates. After making provision for appropriation to Depreciation Reserve Fund to the extent of Rs.45 crores and miscellaneous expenditure, the working expenses will aggregate to Rs.331·35 crores, so yielding a net revenue of Rs.63·03 crores. Out of this sum the railways will pay Rs.50·03 crores to general revenues, leaving a net surplus of Rs.13 crores.

The Budget estimates for 1959-60 show an upward trend in earnings, expenditure, and net surplus. The railways are thought likely to earn Rs.422 crores and expend Rs.284 crores in ordinary working. Appropriation to the Depreciation Reserve Fund will be of the same order as in previous years, Rs.45 crores, and there will be some increase in the dividend to be paid to General Revenue. The next year is expected to end with a surplus of Rs.21 crores.

As to expenditure on the Plan, the outlay rose to Rs.251·47 crores in 1957-58, against Rs.179 crores in the first year. It is expected to be Rs.245·25 crores in 1958-59. A provision of Rs.235 crores is being made in the Budget. This will leave a balance of about Rs.211 crores for 1960-61, the last year of the Plan, out of the total of Rs.1121·5 crores allotted to the railways.

A development to which a great deal of publicity has been given is the diversion of high-rated traffic to road transport on roads parallel to the railways. According to the Minister, the railways can convey any additional traffic which might be moved on such roads. The matter is being considered by the Railway Board with a view to maximum user of the country's limited transport resources. The Indian railways have not found themselves in this predicament for the first time, as before the war of 1939-45 they contended with severe competition from the roads. While the measures then taken to combat it did not meet with much opposition, public opinion, as now expressed in Parliament, does not favour restriction of road transport, and it is felt generally that the country still lacks adequate transport facilities.

# LETTERS TO THE EDITOR

(*The Editor is not responsible for opinions of correspondents*)

## Effects of Diesel Traction

March 2

SIR,—Increases in freight rates are a big factor in the decline of freight traffic. I also believe the diesel locomotive to be the main cause of such increases.

Queensland Railways, like most other systems, adopted diesel traction because much lower operating costs were claimed for diesel compared to steam. Yet in no time at all they were announcing large freight rate increases, record deficits, and closure of branch lines to cut costs, and complaining of road and air competition. The big road transport vehicles, a common sight round Mackay today, were unheard of before diesel haulage on the railways.

A new form of competition which the Queensland Railways will have to face next year in the sugar district of Mackay is the 2-ft. gauge railway which two sugar mills are building at great cost, alongside the Queensland Railways 3-ft. 6-in. gauge track, following a 50 per cent increase in railway rates on sugar cane.

Yours faithfully,

ROGER BOLAND

Middle Creek, Via Sarina, North Queensland

## British Railways Motive Power

March 17

SIR,—Your correspondent, Mr. J. B. Latham, briefly calls attention in his letter published in your March 13 issue, to an aspect of British Railways modernisation which many engineers and outside observers are viewing with some amazement.

One of the few rational and non-political benefits of nationalisation is surely the economic advantages which accrue from standardisation. With motive power a good start was made by the introduction of a standard range of steam locomotives, and of diesel-electric shunting locomotives. What, then, has happened to warrant the seemingly piecemeal acquisition of so many other different types of diesel locomotives? One was told of the pilot scheme for the sampling of different forms of diesel power, but the present situation has gone far beyond what was ever envisaged by that scheme.

Soon after nationalisation a committee of eminent locomotive engineers was set up to examine the whole question of the requirements of British Railways for diesel locomotives. One wonders to what extent the recommendations of that committee have been followed.

It is obvious that there must be many valid and sound reasons behind the present policy of purchasing a large number of non-standard units, and indeed for the whole diesel policy. It would be of the greatest interest to hear from a senior technical executive an answer to questions such as:

1. Why is it necessary, for example, for the Eastern Region to use several types of main-line diesel-electric locomotives while the Western Region uses two types of diesel-hydraulic locomotive?

2. What is the objection to using large numbers of completely standard road-switcher type units of, say, 1,000 h.p., which could be used in multiple unit as required and would so cover the majority of ordinary passenger, freight and mixed traffic duties?

3. What is the objection to using the "building block" principle for express passenger locomotives, so that the requisite power for each roster is available by adding or subtracting units? In the case of a huge machine like the Deltic, it has been stated that many of its duties will be performed while using only one engine. For these periods the second engine is not only non-revenue earning but is a non-paying load. Would it not be much better to use two 1,650-h.p. units, say one "cab unit" and one "booster unit"? It might well be that, instead of requiring 20 3,300-h.p. Deltics, 20 1,650-h.p. cab units and 10 similar booster units would prove more than adequate for the duties envisaged.

4. Why is it not possible to standardise on, say, three designs of diesel engine to cover a horsepower range of, for example, 800, 1,000, and 1,250? The components of such engines could then be largely mass-produced by different manufacturers to British Railways standard specifications.

5. Why is it not possible to standardise one or even two transmission systems? As main-line dieselisation is but a stepping-stone to total electrification, surely diesel-electric traction is the obvious choice both as regards ultimate economy and the gaining of experience in manufacture, maintenance and handling.

6. Is is true that on delivery some types have been found to have axle-loads considerably in excess of those allowed by the civil engineer for the routes for which the engines were intended? If so, how does such miscalculation occur?

7. To what extent have (*a*) political consideration; (*b*) the need for British Railways to act as a guinea-pig for the export market; and (*c*) the inability of British manufacturers to supply exactly what was needed influenced the present policy affecting diesel traction?

There is no implied criticism in this letter, only the very real desire of one who has made a life-long study of railway motive power to know the real reasons behind a policy which, on the surface, is a contradiction in terms.

Yours faithfully,

P. RANSOME-WALLIS

The Corner House, Herne Bay, Kent

# THE SCRAP HEAP

### Right oar Wrong

Since time immemorial it has been the custom of oarsmen to hold the oar in front of the body. London Transport apparently has devised a better means of aquatic propulsion. The poster, advertising tomorrow's Boat Race, shows two crews with oars behind their backs. Unless, perhaps, the coxes are in the wrong end.

### Penny Fares on the Twopenny Tube

There was a marked increase of business on the Central London Railway owing to the introduction of penny stages. Large posters outside stations announcing the reductions made a popular appeal.—*From the "Evening News," March,* 1909.

[When the Central London Railway was opened in 1900, it had a universal fare of 2d., which quickly earned it the name Twopenny Tube. Because of a heavy drop in passengers resulting from the introduction of the motorbus, a 3d. fare for longer journeys became effective from July 1, 1907. The 1d. fare for three stations was adopted on March 14, 1909.—ED., *R.G.*]

### On the Old Lines

The perky little lion with the legend of British Railways may say what he pleases, but we still go from Paddington by the Great Western and from Kings Cross by the Great Northern and nothing will stop us. Those approaching a second childhood may even recall the bad old days when they set out to drive some miles to the station at the same time the train was due to start from it, and still talk affectionately of the South Eastern. And what a thrill it was to tell our porter at Euston, quite superfluously, to label our luggage to somewhere "on the Cambrian line"! That was far from implying perpetual motion but it was a blessed thing nevertheless. —*From "The Times."*

### Jubilee of New Zealand Express

The 50th anniversary of the inauguration by the New Zealand Government Railways of regular express passenger trains between Auckland and Wellington was celebrated on February 14. About 200 passengers travelled by the first train from Auckland to Wellington, and were welcomed by a crowd of 1,500 when they arrived at the capital. For the few months after November, 1908, travellers by train from Wellington to Auckland had had to break their journey with an overnight stop at Ohakune. Now they were taken through by overnight train in 19¼ hr.

During a coal shortage in 1919, the expresses were withdrawn altogether for several months. The best scheduled time for the northbound journey has been 13 hr. 5 min.

In 1909 the locomotives hauling the expresses were mainly 80-ton "A" class engines, but 95-ton "X" class locomotives were often used over the mountain section between Taihape and Taumaranui. They hauled trains of 200-250 tons weight.

Introduction of heavy steel stock in 1931 increased the weight of trains frequently to over 300 tons, and doubleheading became increasingly necessary. To obviate this expensive practice, the "K" class locomotive was introduced in 1932. After 1946 most of these 140-ton locomotives were converted to oil burning, which has enhanced their performance.

### Inner Circle Revellers

About 150 revellers boarded an Underground train at Sloane Square shortly before eight o'clock last week, carrying bottles and glasses. With them on the crowded westbound Circle Line train went half-a-dozen railway police. When the party, in the words of another traveller, became "a little boisterous," police asked them to break up. They alighted at various stations. They rejoined later trains and returned to Sloane Square. Railway police were waiting to foil any attempts to continue the merrymaking.—*From "The Daily Telegraph."*

### Buckled Beam in Concrete Bridge

A concrete beam, 113 ft. long, buckled while being stressed before being placed in position in a post-stressed concrete bridge built by the Kent County Council to carry the Orpington to Chislehurst road over the Southern Region main line between Bickley and St. Mary Cray.

It has been necessary to remove and replace the beam, which is 3½ ft. wide and cast in five sections. Post-stressed concrete was chosen by the County Council. The railway civil engineer would have preferred steel.

*Photo* [*Evening News*

*The buckled concrete beam in the overline bridge between Bickley and St. Mary Cray, Southern Region*

### First Special Train on Vatican Railway

No passengers are believed to have been conveyed hitherto by the Vatican Railway, the short length of line giving the Italian State Railways access to the Vatican City. The railway and an imposing passenger terminal building on Vatican State territory were completed in 1932 under the provisions of the Lateran Treaty of 1929, between the Holy See and the Kingdom of Italy. A brief illustrated description was given in our September 15, 1950, issue. Traffic so far has consisted of wagons of relief parcels distributed by the Pope to prisoners of war and others in need. The original Papal train, consisting of three vehicles, including a saloon containing a throne, is believed to be extant. It is said to be the one by which Pope Pius IX left Rome in 1870 for Civitavecchia where he embanked for Gaeta. The Papal journeys between the Vatican and the summer residence at Castelgandolfo have been made by road in recent years.

For conveyance to Venice, next month, of the body of St. Pius, who before reigning as Pope Pius X in 1903-14 was Cardinal Patriarch of Venice, the Italian State Railways are reported to be preparing a special train, the first, other than rakes of wagons, to run over the Vatican Railway.

### Trans-Sahara Railway Proposal (1899)

The French political economist, M. Paul Leroy-Beaulieu, urges upon his countrymen to construct at once a railway across the Sahara. He says the Fashoda incident shows the necessity of making some such link to bind together the scattered portions of the French possessions in Africa. The railway should start from opposite Marseilles and should be carried to Lake Chad by the shortest possible route. The line, by the proposed route, would be relatively easy to carry out and inexpensive, and the line from Cairo to the Cape, about which the British were making so much fuss, would commercially and politically be of very little importance.—*From "The Financial Times," March* 18, 1899.

[The Mediterranean-Niger Railway, with offices at Oudja, Algeria, is the administrative form of the Trans-Sahara Railway scheme, intended ultimately to link the Algerian ports with the banks of the Niger. Construction was authorised in 1941 of a standard-gauge line southwards from Bou-Arfa, on the Moroccan Railways, through Colomb-Béchar, to In-Tassit. At the last-named point the route bifurcates, with one branch to Niamey and the other to Segou. About 170 miles have been opened and further surveys are reported to be in progress.—ED., *R.G.*]

# OVERSEAS RAILWAY AFFAIRS

*(From our correspondents)*

## INDIA

### New Branch Line

The Railway Board has approved the survey of a new branch line taking off from Bijuri-Karonji line, on the South Eastern Railway, to serve the Korea coalfields.

### Ticketless Travel

Some 10,689 passengers were arrested for travelling without tickets in the course of 78 cross-country checks and 56 concentrated spot-checks held in November, 1958. The total number of ticketless travellers arrested in similar checks was 8,837, in October, 1958, and 3,667 in October, 1957.

### Branch to Etah Opened

The branch of the Northern Railway from Barhan, on the Delhi-Cawnpore main line, to Etah, has been opened by the President of India, Dr. Rajendra Prasad. The new line is stated to be 37 miles long, of 5-ft. 6-in. gauge, and to have been built entirely with local labour. The terrain is flat, and no major work is understood to have been necessary.

## NEW ZEALAND

### Branch Line Closure

After 42 years of operation, trains ceased to run on the Gisborne-Motuhora branch line in the North Island on March 14. The 48½-mile line, the building of which was started in 1900, and which was opened in 1917, has been running at a loss for some years. Its closure was foreshadowed in a review of uneconomic branch lines recently. In its early years the line was an important factor in the development of hill-country farms and in the expansion of the Motu Valley bush milling industry. At its peak in 1920 the line handled 174,000 sheep, over 7,000 head of cattle and 6,500,000 ft. of timber. Since the early 1920s road transport has been making inroads into freight and passenger traffic in the district.

### Diesel Locomotive Deliveries

The first of 18 400-h.p. diesel-electric shunting locomotives built by British Thomson-Houston Co. Ltd. for the Government Railways has arrived at Auckland. Two more of the locomotives have left the U.K., and are expected to reach Auckland by the middle of April. It is hoped to have all the locomotives in use by mid 1960. They will be used on heavy shunting duties in the larger railway yards.

## CANADA

### Diesel Locomotive Deliveries

During 1958, Canadian National Railways took delivery of 304 diesel locomotives, bringing the total number of diesel units in service up to 1,736.

### Hopper Wagons

New rolling stock for use in the Newfoundland district of the Canadian National Railways is now being delivered from the manufacturer, Canadian Car Foundry Company, Montreal. It consists of 32 40-ton longitudinal hopper wagons, 23 of which are now at Truro. The wagons will be held there for forwarding to Newfoundland via North Sydney until such time as there is an improvement in ice conditions in the Cabot strait.

### Marshalling Yard at Toronto

The Canadian National Railways is to purchase 1,185 acres of land for a freight classification yard north of the city of Toronto, and some 32 miles of right-of-way for the construction of two access lines linking the yard with existing main lines. The project is complementary to the three hump yards under construction at Winnipeg, Montreal, and Moncton.

Federal legislation will be necessary before the company can proceed with the Toronto plan. Financing will be provided through regular budgetary procedure.

## ARGENTINA

### International Route Closed

Avalances of mud have caused the closure of the route to Bolivia and Peru. The line is completely covered at Volcan Station on the Belgrano Railway. Embankments have also been washed away at Purmamarca and Maimará.

### Increases in Fares and Charges

The recent increases in rates and charges in force since February 1, have been further augmented as from March 1. Suburban and local season tickets, up to a distance of 93 miles, have been increased by 30 pesos first class and 20 pesos second class. The cost of season tickets has thus been practically doubled through three increases in as many months. Goods rates have been increased again by reclassifying all categories to the one immediately above it in the rate book. Buenos Aires Transport has increased bus, microbus, and trolleybus fares to two pesos a trip.

## FRANCE

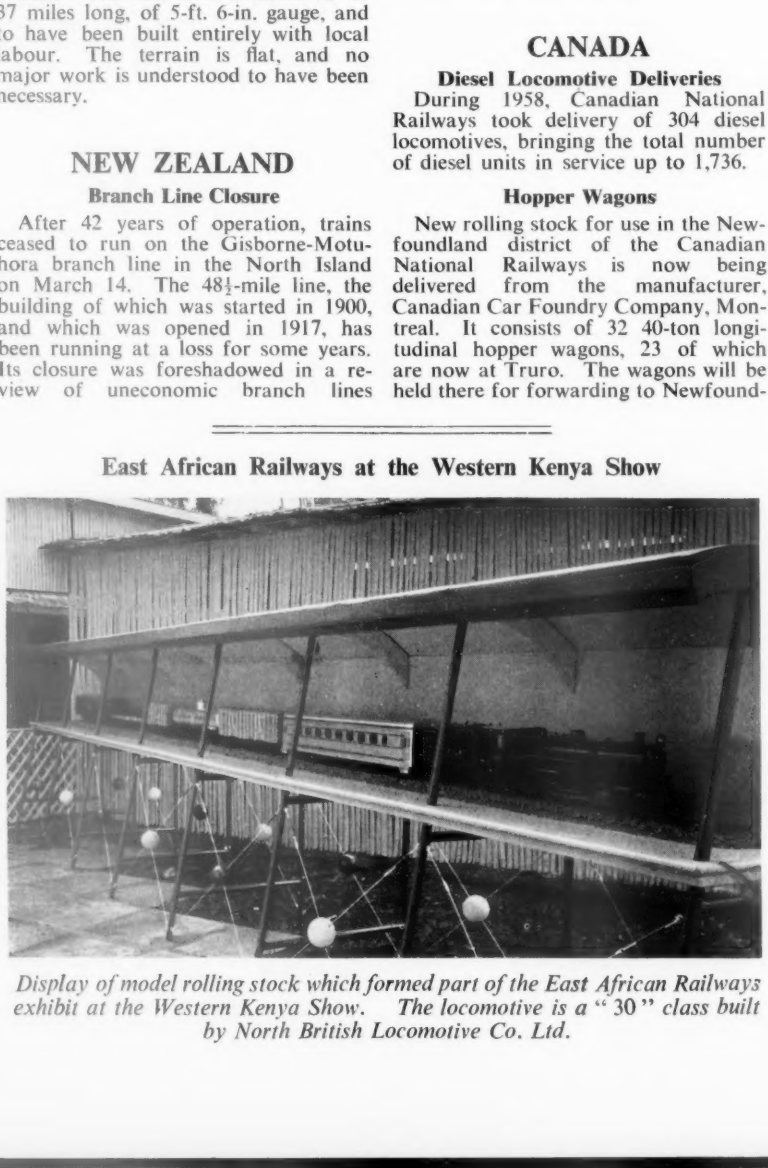
### Closing of Lines

Under the Government economy programme, closing is envisaged of 112 route-miles to both passenger and freight traffic and of a further 300 route-miles to passenger traffic only. No details have been announced.

### Brake Tests at Laroche-Migennes

To assess the braking weight of new coaches before their entry into express passenger service, the National Railways has been carrying out braking tests on a section of the Paris-Dijon line between Joigny and Laroche. Before the tests the brake shoes were run in by operating the coaches on stopping trains. For the actual tests the vehicle was hauled by an electric locomotive which, by means of an automatic uncoupling device, released it at a point 110 yd. before the testing area was reached, when a constant speed of 75 m.p.h. had

### East African Railways at the Western Kenya Show



*Display of model rolling stock which formed part of the East African Railways exhibit at the Western Kenya Show. The locomotive is a "30" class built by North British Locomotive Co. Ltd.*

been attained. At the entry point to the testing area, another automatic device applied the brake. By measuring the stopping distance the braking weight of the vehicle could be calculated.

### Punctuality

During 1958, the National Railways recorded some improvement compared with the previous two years, in the monthly percentages of fast and express trains arriving at their destination less than 14 min. late. To the end of April, 1958, between 3 and 4 per cent of such trains experienced delays exceeding 14 min., an improvement on 1956, but slightly worse than in 1957, when the weather was better. The 1958 figures, which varied between 2 and 3 per cent, showed an improvement over the two previous years.

### Bridge Contruction

The doubling of Boulevards Militaires at Paris to ease road congestion incorporates a section of new road between the Porte de Versailles and the Porte d'Italie, and until recently the line of this new road crossed under the Montparnasse-Versailles and Montparnasse Le Mans lines by the Vallée bridge near Vanves-Malakoff. The span was inadequate for the proposed road lay out, and, at the end of 1957, work was started on the construction of a new bridge, given an opening of 208 ft. This will ultimately involve the installation of six new reinforced concrete bridge decks resting on steel girders supported on concrete pillars. To enable the work to be carried out without interference with railway traffic it was necessary to construct two temporary tracks above the existing tracks. By the end of 1958, three permanent bridge decks had been installed, and it is hoped that the work will be completed by the end of this year.

### Waterproofing of Caluire Tunnel

The 7,880-ft. Caluire Tunnel on the Collonges-Fontaines to Lyon-St. Clair line, between the Rhône and Saône Valleys, has, since its construction towards the end of the 19th century, been extremely susceptible to water penetration. Soon after the 1939-45 war, some 1,180 ft. of the tunnel was waterproofed, but the water subsequently ran along and penetrated the non-waterproofed section. Further work was put in hand in October last, and this was recently completed. Over an additional 980-ft. section of double track, the water has been led, by means of channels drilled across the roof, into side drains and thence to the invert and the central drainage system. Renewal of the track and an inspection of the electrical equipment was carried out at the same time. Some traffic was diverted to other routes and temporary single-line working enforced.

## WESTERN GERMANY

### Strengthening "Blauer Enzian" Service

Because it is impossible to strengthen the five-coach unit at peak periods, the air-conditioned Henschel-Wegmann set now working the "Blauer Enzian" ("Blue Gentian") service on alternate days between Hamburg and Munich, is to be withdrawn this summer. This locomotive-hauled train, which includes an observation car, was built for the Berlin-Dresden service in 1936, when it was hauled by streamlined 4-6-4 tank locomotives. It was re-conditioned and placed in service in 1953.

### Electrification

By 1959 the Federal Railways plan to have 2,150 miles of line electrified. The final target under the electrification programme is 5,200 miles. This mileage should be completed in six years' time. All parts of the system where traffic density justifies it are to be electrified.

### Door-to-Door Freight Service

The Federal Railways door-to-door freight and luggage service has been simplified. The service need not now be paid for in advance. The rate for payment on delivery is DM 1.30 for the first 50 kilograms, and DM 1 for each additional 50 kilograms.

## BELGIUM

### Reductions in Services

As an economy measure, the National Railways plan withdrawal of passenger services over several sections totalling 750 route-miles. These lines would be kept open for goods traffic. About 250 small stations, none of which handles more than a wagonload a day, are to be closed for all traffic. Less than 3 per cent of total traffic is dealt with by 1,050 stations.

### Proposed Alterations in Charges

A re-organisation scheme for the National Railways envisages increases in passenger fares by an average of 7½ per cent and reductions in freight rates of 10 per cent. The object is to keep the railways competitive for goods traffic within the European Common Market.

## Publications Received

*A Picture History of U.S. Transportation.* By Roderick Craib. New York: Simmons-Boardman Publishing Company, 30, Church Street. 11¼ in. × 8¾ in. 124 pp. Illustrated. Price $6.—Information is given on several aspects of railway activity, notably on the growth of competition for traffic and the steps taken by the railways to meet it. The emphasis is on railways in the late 19th century and up to the present day. The many photographic illustrations, some of recent date, are well chosen, reproduced, and captioned.

*Electro-Mechanical Brakes.*—Integral electro-mechanical brakes, designed and manufactured by Lancashire Dynamo & Crypto Limited for spigot mounting to the end shield of both vertical and horizontal spindle motors, are featured in a leaflet, List ML87, issued by that company. Applications illustrated include an 8-in. brake on the d.c. motor used for beam turning on a 15-ton slab-piling crane at a steelworks, and smaller brakes such as those fitted on the motor driving a three-way tapping machine for engine cylinder heads. Types suitable for single-phase, three-phase, and d.c. motors dispense with the need for support brackets and additional external wiring. Details of design, rating and method of selection according to application are given in a separate list, R14. Both publications are available from Lancashire Dynamo & Crypto Limited, St. Stephen's House, Victoria Embankment, Westminster, S.W.1.

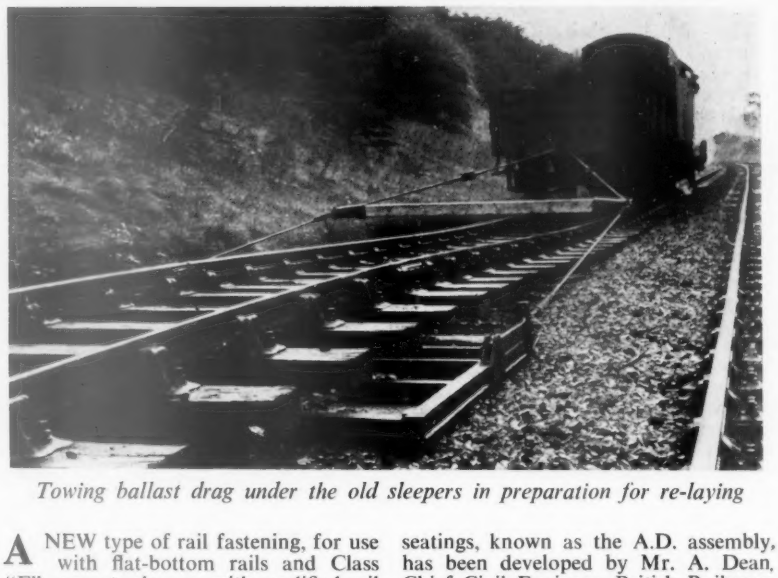
*Tolerance Rings.*—A 36-page catalogue published by George Angus & Co. Ltd., describes applications for Star tolerance rings manufactured by this firm from corrugated spring-steel strip. Two of the standard types are intended to provide an interference fit in the mating of shafts and bores up to 3-in. dia. Type AN is used where the standard nominal shaft or ball-race outer dia. is pre-determined, and type BN is used where the bore is the pre-determined nominal size. Tables list the Star limits for machining the mating parts. These are much wider limits than would be allowed for press fits in conventional assemblies. The same tables show how the maximum permissible torque transmitted varies according to the length of the tolerance ring. Other tables indicate limits for grooves where needed for axial location. Special applications illustrated are type ANK used for fixing control knobs and type ANL for ball bearings of the type which require exceptionally light press fits to avoid distortion of the races. Copies are available on application to George Angus & Co. Ltd., Oil Seal Division, Coast Road, Wallsend-on-Tyne.

*Tungsten Carbide Tipped Saws.*—An illustrated leaflet, "Speedicut Mita Carbide Tipped Saws," available from Firth Brown Tools Limited, P.O. Box 59, Sheffield, describes the application of tungsten-carbide tipped high-speed circular saws for cutting the most abrasive hardwoods, non-ferrous metals, lightweight refractory bricks, mica boards, and so on. Recommendations are made as to the tooth pitch best suited to each purpose, and the dimensional details provided under each main heading enable the correct wheel diameter and cutting width to be selected. It is claimed that 50 times the life of a normal saw can be obtained, but because the cost of Speedicut wheels is relatively high, regular and timely re-sharpening is essential to secure maximum economy in use.

XUM

# The A.D. Rail Fastening for Concrete Sleepers

*Development by British Railways, North Eastern Region, of fastening for track-circuited long-welded rails: improved method of re-laying*



*Towing ballast drag under the old sleepers in preparation for re-laying*

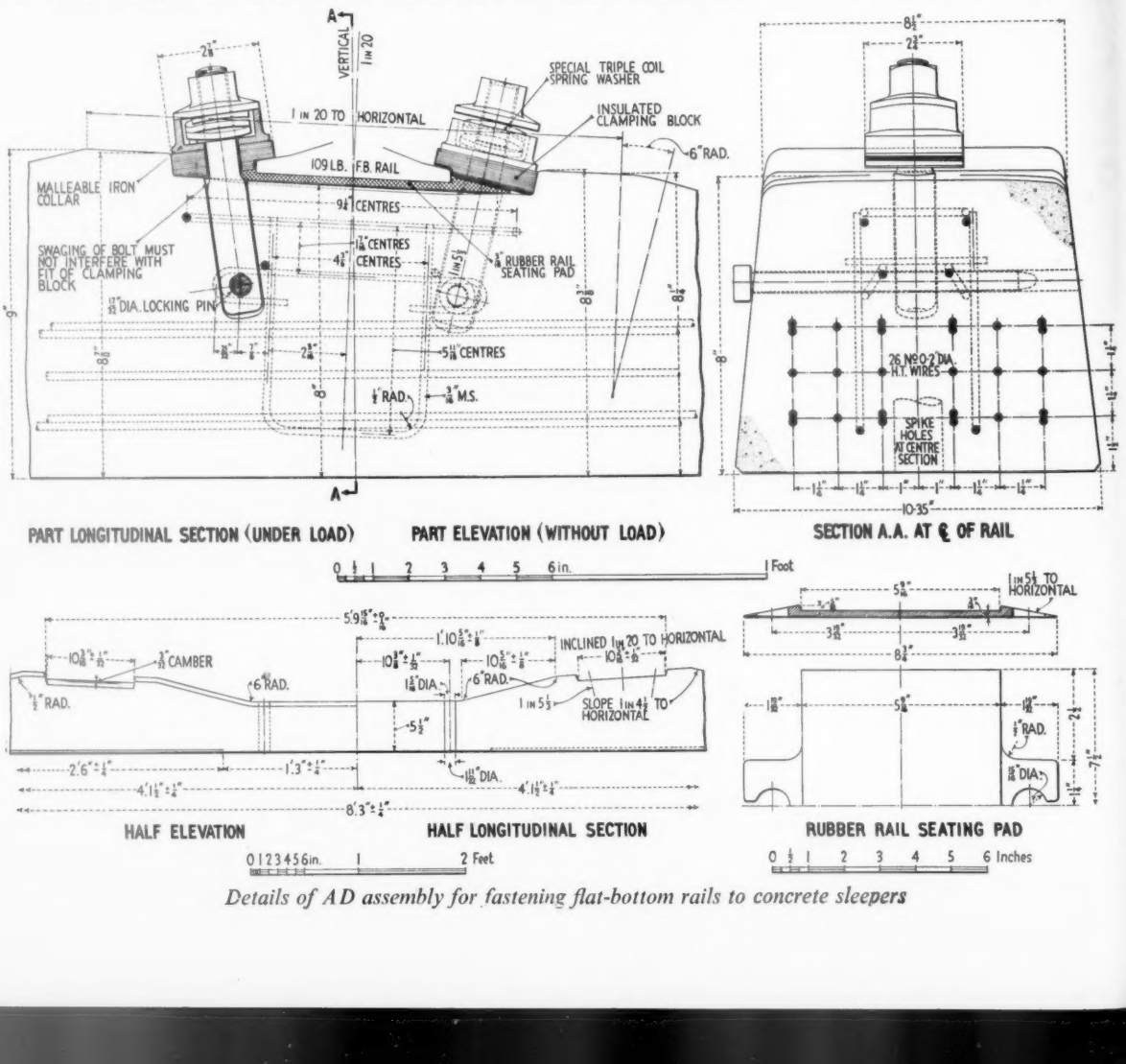
A NEW type of rail fastening, for use with flat-bottom rails and Class "F" concrete sleepers with modified rail seatings, known as the A.D. assembly, has been developed by Mr. A. Dean, Chief Civil Engineer, British Railways, North Eastern Region. After successful trials under exacting track conditions, 2¾ miles of concrete sleepered track with long-welded rails, using the new A.D. assembly, were laid in the main running lines on the North Eastern Region last year. A further 12 miles are scheduled to be laid during the current year.

### Assembly

The assembly consists of an insulating clamping block, malleable cast-iron containing collar, and triple-coil spring washer. These are secured firmly in position against the rail foot by a holding-down bolt, tightened by a flanged nut and restrained by a locking pin which passes transversely through the concrete sleeper and also through a hole in the end of the holding-down bolt.

The rail is seated on a rubber pad $\frac{3}{16}$ in. thick with retaining lug extensions which fit snugly round the holding-down bolts and up to the sides of the rail foot.

A feature of the assembly is the

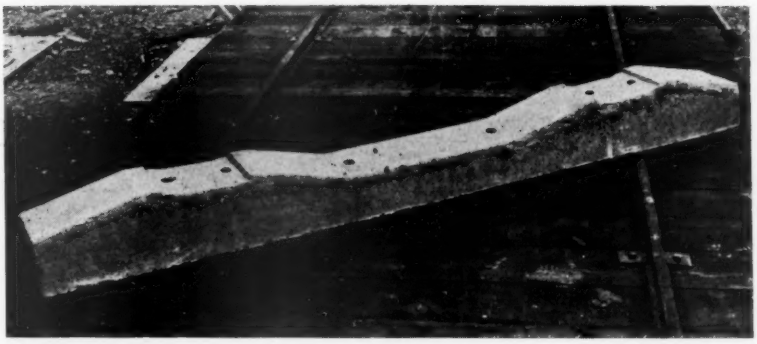



*Details of AD assembly for fastening flat-bottom rails to concrete sleepers*

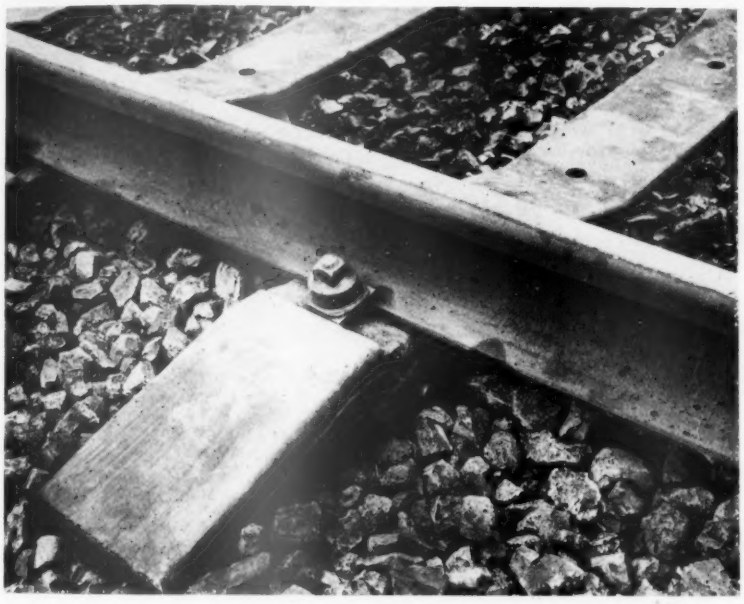
standard of tension maintained in both static and dynamic conditions. This is achieved by the inclusion of the special triple-coil spring washer which provides, within practical limitations, for applied bolt loadings to accord with the deflection characteristics of the spring washer.

The spring washer is housed in the malleable iron collar, the internal depth of which has been determined by the free height of the washer and the extent to which it must be compressed so as to transmit the bolt loading through the containing collar and clamping block to the foot of the rail.

Tensioning of the assembly is achieved by tightening the flanged nut of the holding-down bolt so that when the nut contacts the upper circumferential surface of the containing collar, the necessary static loading is applied. Under dynamic loadings imparted by traffic, slight resilient deformation of the rubber pad occurs, but relative tightness of the fastening on the rail foot is retained by the reaction of the coil spring washer. Experience has shown that maintenance attention to loose fastenings is negligible.



*Class "F" concrete sleeper, showing inclined holes for the rail fastening, transverse holes for the locking pins, and $1\frac{5}{16}$-in. holes in the centre line position to take either A.T.C. apparatus or spikes to provide additional resistance against lateral track movement*



*AD fastening in position, showing locking pin passing transversely through sleeper, and holes in centre line*

**Clamping Blocks and Seating Pad**

The clamping blocks are machined from laminated resin-bonded beechwood. With the natural rubber rail seating pad, they ensure the electrical insulation of the rail. The rubber pad is designed to take up the shear stresses in the rubber when subjected to impacting traffic loadings and so avoid, or minimise, abrasive wear of the pad.

The spring washers are helical springs of rectangular section with triple coils. Each coil has an additional set which, besides the ordinary deflections, gives an increased tensioning capacity. The containing collar is in blackheart malleable iron, shaped to fit over the insulating clamping block and is treated with a protective coating against rust.

The holding-down bolt is of steel and housed in an inclined hole in the concrete sleeper. The bolt is $1\frac{1}{8}$ in. dia. swaged down to $\frac{7}{8}$ in. at the screwed end. Holding-down bolts and locking pins are treated at the time of assembly with a bitumen sealing compound to prevent corrosion and seizing.

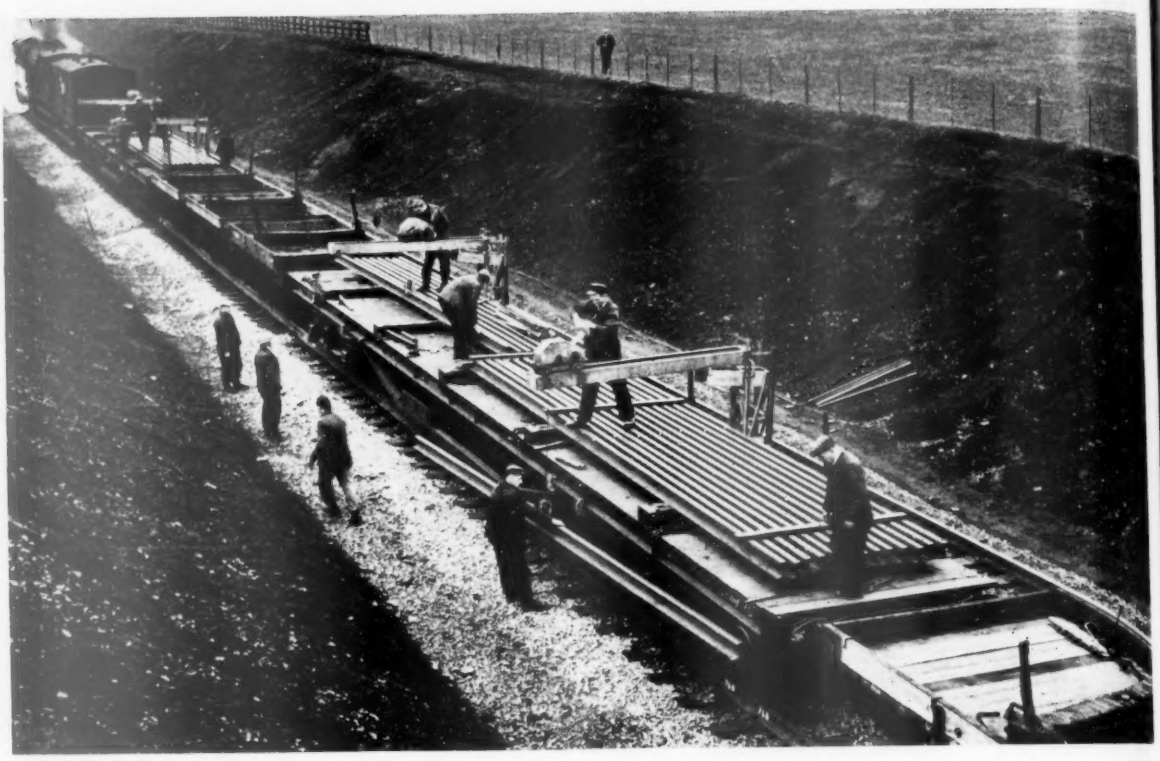
The components lend themselves to simple assembly and are easy to replace. There is the further advantage that this fastening, as regards insulation of track circuits, is more acceptable to the signal engineer than many others.

The designed nominal gauge for 109-lb. flat-bottom rails is 4 ft. $8\frac{7}{16}$ in. and resistance to lateral movement of the rails relative to each other is supplemented by the bearing of the insulating clamping blocks against the shoulders of the sleepers. Additional resistance to any possible lateral track movement can be provided, should the need arise. There are two $1\frac{5}{16}$ in. dia. holes in the sleeper on the centre line position in the 4-ft. way to take spikes of suitable length which can be driven through into

(*Continued on page* 367)

*Assembling pre-fabricated 30-ft. track sections at Dinsdale Rail Depot, North Eastern Region. Final tightening of the flanged nut is by impact wrench powered by compressed air*

# The A.D. Rail Fastening for Concrete Sleepers



*Picking up short service rails, working with small cantilevered cranes mounted on rail-carrying wagons*

*Morris tracklayer placing 30-ft. track section in position*

# The Effect of Suspension Design on Rail Stresses

*By J. L. Koffman*

*The matching of spring stiffness and damper characteristics as an aid to improving riding and reducing rail stresses*

THE stresses caused by pressures at the point of contact between the periphery of circular or spherical bodies were first theoretically examined by H. Hertz[1]. As far as the particular problem of stresses at the point of contact between wheel and rail is concerned, attention should be drawn to the work due to Beliaev whose papers[2] are of fundamental interest. Although some of the results were mentioned by Timoshenko[3], Beliaev's extensive work on the subject of wheel and rail contact stresses is practically unknown in this country. Briefly, Beliaev has originally shown that the point of dangerous stress is below the head surface of the rail and that the magnitude of the stress is:—

$$\delta_1 \approx 0.6\ \delta_{max}$$

The value of the maximum normal stress in the centre of the contact ellipse is given by:—

$$\delta_{max} = m_q \sqrt[3]{PE^2/R^2}$$

where P is the load, E the modulus of elasticity and R the wheel radius. The value of $m_q$ depends on R and also on the rail head radius r, the relevant values being given below:—

| r/R | 1 | 0·9 | 0·8 | 0·7 | 0·6 | 0·5 | 0·4 | 0·3 | 0·2 | 0·15 | 0·1 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| $m_q$ | 0·388 | 0·4 | 0·42 | 0·44 | 0·468 | 0·49 | 0·536 | 0·6 | 0·716 | 0·8 | 0·97 |

Brief reflection shows that the stresses are not inversely proportional to the wheel radius and that the ratio r/R is of considerable importance. It also will be noted that an appreciable change in wheel radius will be required to ensure a worthwhile reduction of the contact stresses. As already mentioned by Beliaev, "to reduce this stress by increasing the wheel radius is extremely unprofitable and is practically almost impossible," but other ways of attack are indicated via improved quality of the rail steels or by increasing the rail-head radius, or both. In addition, the possibilities of reducing the dynamic loads imposed by the vehicle on the track merit serious consideration, and here attention must be paid to the allocation of the static deflections to primary and secondary suspension systems and to the magnitude of the damping forces.

### Dynamic Deflections

The effect of the mass and static spring deflections, as well as of the damping, on the dynamic deflection of primary springs previously were considered in the case of a 100-ton Co-Co locomotive.[4] The dynamic deflections were plotted in terms of a magnification factor, i.e., the deflection of the primary springs divided by the height of the "obstacle" or by the equivalent wheel displacement. It should be mentioned here that the path of the wheel passing over a rail joint cannot be considered as strictly equivalent to being caused by a descending or ascending step, but, as suggested by Inglis,[5] the rail joint may be likened to a concealed pothole, increased speeds reducing the descent of the wheel, the depression becoming shallower and longer. Inglis concludes that there is a critical speed at which rail joint impact is a maximum, but that this critical speed, like any maximum or minimum phenomenon, is not capable of exact experimental determination. It also should be added that the speeds at which such maxima are likely to occur will depend on vehicle and track design, *i.e.*, upon vehicle masses, spring stiffness values and damping factors, as well as on certain leading vehicle dimensions on the one hand and on rail length and the dynamic characteristics of the permanent way on the other.

The loads imposed on the rails by moving vehicles will be the resultant of the static wheel load $P_1$, the additional dynamic load $P_2$ due to the unsprung mass, and the dynamic load $P_3$ due to the oscillations of the sprung mass. The value of $P_2$ will depend on a number of factors such as track irregularity at the rail joint, sprung and unsprung weights, mass and inertia of the track which takes part in the oscillations, its stiffness and the vehicle speed, as well as wheel diameter D. In addition, the stiffness of the various vehicle components, including the torsional and vertical stiffness of the motor drive with electric or diesel-electric vehicles is of considerable importance. Thus, the value of $R_2$ might be expected to increase as a function of speed,[6] but inversely proportional to $D^{\frac{1}{2}}$ and $\rho^{\frac{1}{2}}$, where $\rho$ is a function of the track mass $m_q$ taking part in the shock and reduced to the point of impact, and the unsprung weight. The value of $m_q$ is not substantially affected by track parameters and some representative values are given in Ref.[7]

The spring characteristics of the track are made up of the stiffness of the rail, baseplate, sleeper and ballast, and as all these components act in series, the softest component—in this case the ballast—is the controlling factor, its stiffness being in the order of 250 to 750 ton per in.,[8] while the total track stiffness is about 125 to 250 ton per in.[7] The natural frequency of the track under load is of the order of 25 to 30 cycles per sec.,[9] so that resonance is not likely to occur here at present day speeds with the suspension system.

### Axle-hung Motors

With axle-hung traction motors the magnitude of the hammer blow can be appreciably reduced by reducing the rotational acceleration of the armature subsequent to the vertical acceleration of the wheels. This can be achieved by introducing a certain amount of torsional resilience at the gear wheels.[10] The more recent development of the semi-axle-hung motor[11] also is a step in the right direction as far as the use of a simple drive resulting in reduced hammer blow effects is concerned. Generally, it is recognised that the unsprung masses result in the dynamic wheel-load increasing with speed, and it should be possible to evaluate this dependence numerically, provided the effective deviation of the track from the horizontal level at the rail joint, etc., is known. Once this is the case, the subsequent calculations of the amplitudes of oscillations of the sprung vehicle components and the accelerations and displacements of the unsprung masses readily can be determined.[12]

Because of this, it must be mentioned that the determination of the "effective obstacle" shape as encountered by vehicles of different types over a wide range of speeds at the rail joints and along the track should be considered as a pressing investigation relating to the interaction between vehicles and track. The investigations usually carried out along the lines of rail load determinations—and this without taking into account the finer points of vehicle and track dynamics—while providing an overall pattern of load magnitudes do not allow for the effect of vehicle design parameters. Apart from this, the effect of rail, etc., inertia, particularly at high speeds, will lead to differences between the pattern of measured loads and the contact and shear stresses. The results are likely to encourage some and discourage others in a rather sweeping fashion, without providing clear and unambiguous guidance to the rational development of vehicles designed to achieve best all-round riding qualities of benefit to track, vehicles, passengers, and freight. Once the nature of the track inertia action and the magnitudes of the "obstacles" in terms of wheel displacement are known, the dynamics of vehicle behaviour should be susceptible to a more rational analysis of great

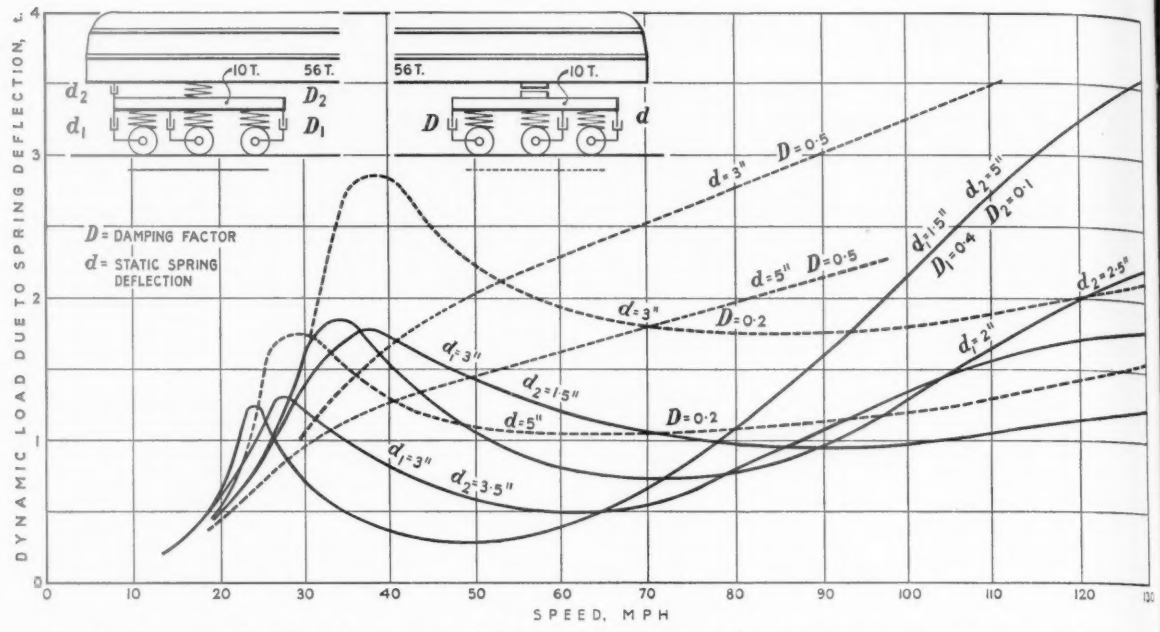



*Fig. 1—Dynamic wheel load due to spring deflection as a function of deflection distribution and damping factors*

benefit to designers and operators alike.

The effect of spring and damper characteristics on the dynamic loads due to the action of sprung masses may be considered for the case of a 100-ton bogie locomotive.[4] Assuming that the unsprung masses will be displaced by a certain amount when moving over rail joints, the resultant deflection of the primary springs can be determined from the previously plotted values of the magnification factor. Furthermore, since the force-displacement characteristics of the springs are also known, the deflections can be interpreted in terms of load imposed on the wheels, in addition to the static load due to the sprung mass as represented by the static spring deflection. This has been done for the above-mentioned example, assuming an "effective" vertical wheel displacement of 0·25 in. The results are plotted in Fig. 1, this time in terms of dynamic load in tons versus speed in m.p.h. In addition to the data relating to bogies incorporating primary and secondary suspension, the results of calculations relating to vehicles fitted with primary suspensions only are given. This latter data can be readily obtained[13] and the conditions relating to rather heavy damping (D=0·5), and a deflection of 3 in. is representative of steam locomotive practice. It should be stressed that these calculations refer only to bouncing oscillations and that the magnitudes of the load increments might be increased due to pitching and particularly due to swaying.[4]

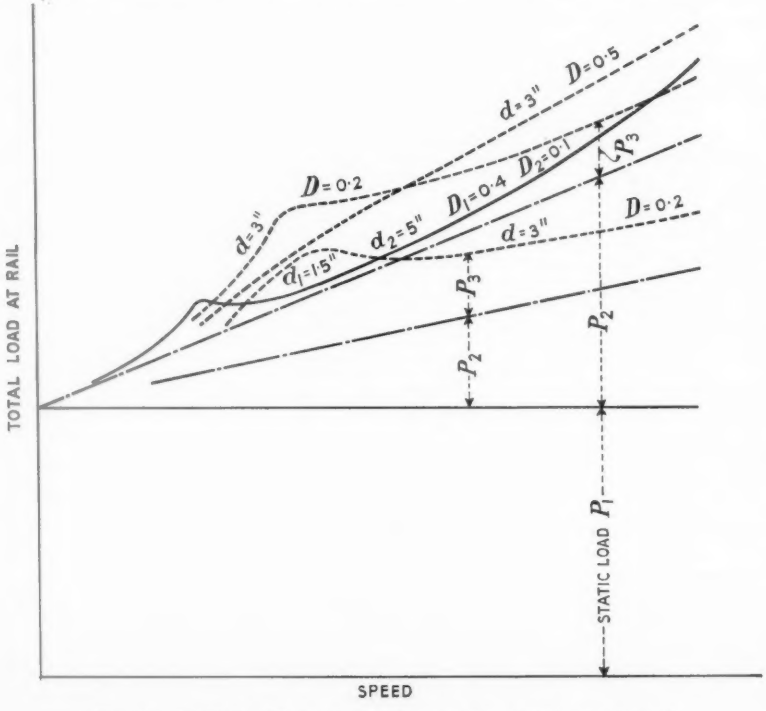



*Fig. 2—Possible effect of vehicle speed on total wheel load*

The total wheel-load thus will depend on vehicle as well as track characteristics. It will comprise the static load $P_1$, the dynamic augment $P_2$ due to the unsprung mass, and a further augment $P_3$ which will depend on the dynamic characteristics of the vehicle. The approximate dependence of the total wheel-load versus speed, which might be encountered in service, is plotted in Fig 2. As indicated by the dotted curves, the final dependence will be appreciably influenced by $P_2$ and possibly to a lesser extent by $P_3$ and the condition may even arise when the total load, after an initially rapid rise, will rise very slowly until the second resonance condition is approached, which might be encountered at a relatively high speed.

The incidence of the rise of $P_2$ and $P_3$ to a certain extent will depend on track characteristics, particularly if their magnitudes are measured in terms of rail strain. Thus, a slowly moving vehicle will result in a certain amount

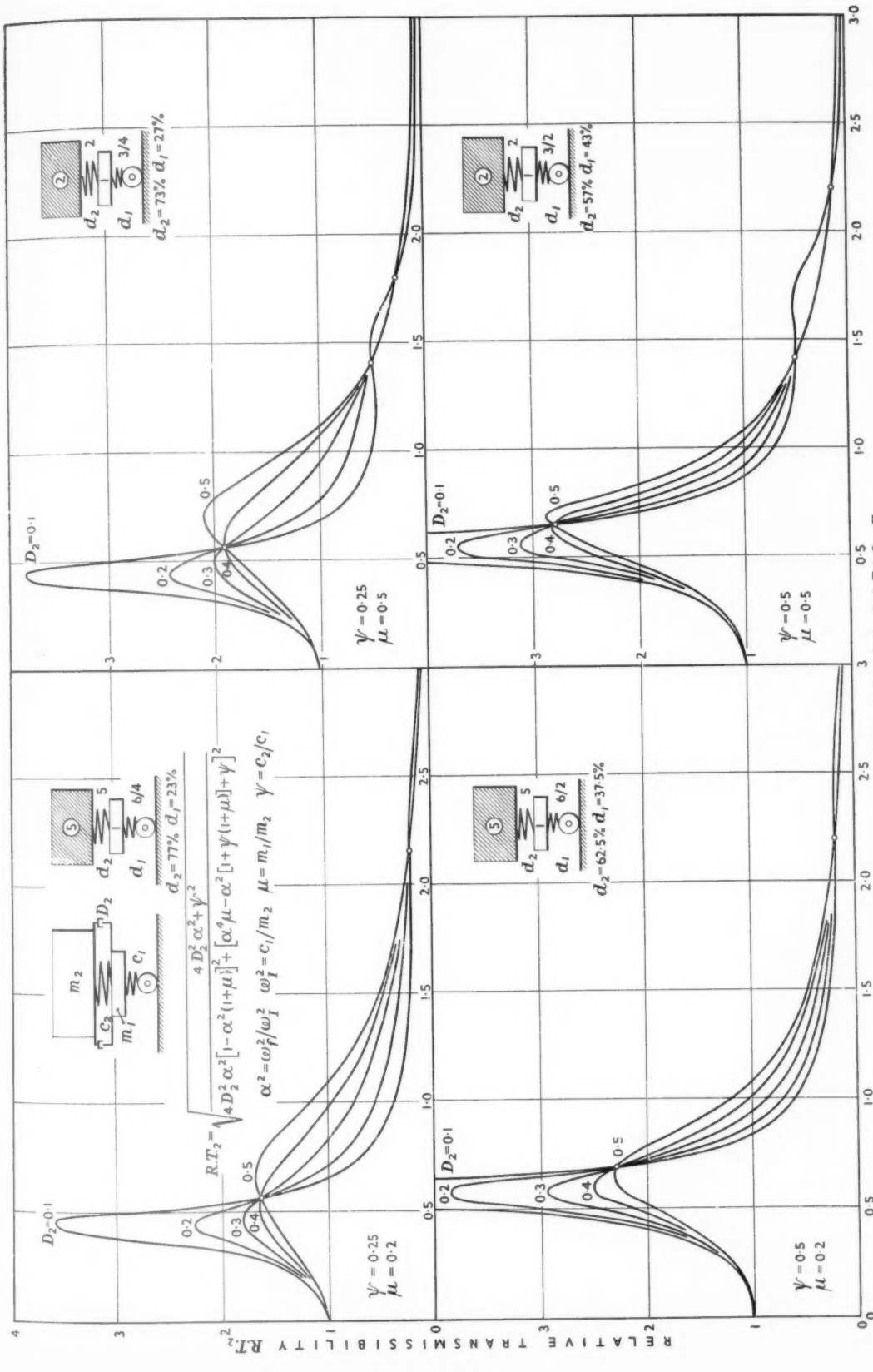



*Fig. 3—Effect of spring stiffness, mass ratio and bolster damping factors on body displacement relative to the ground*

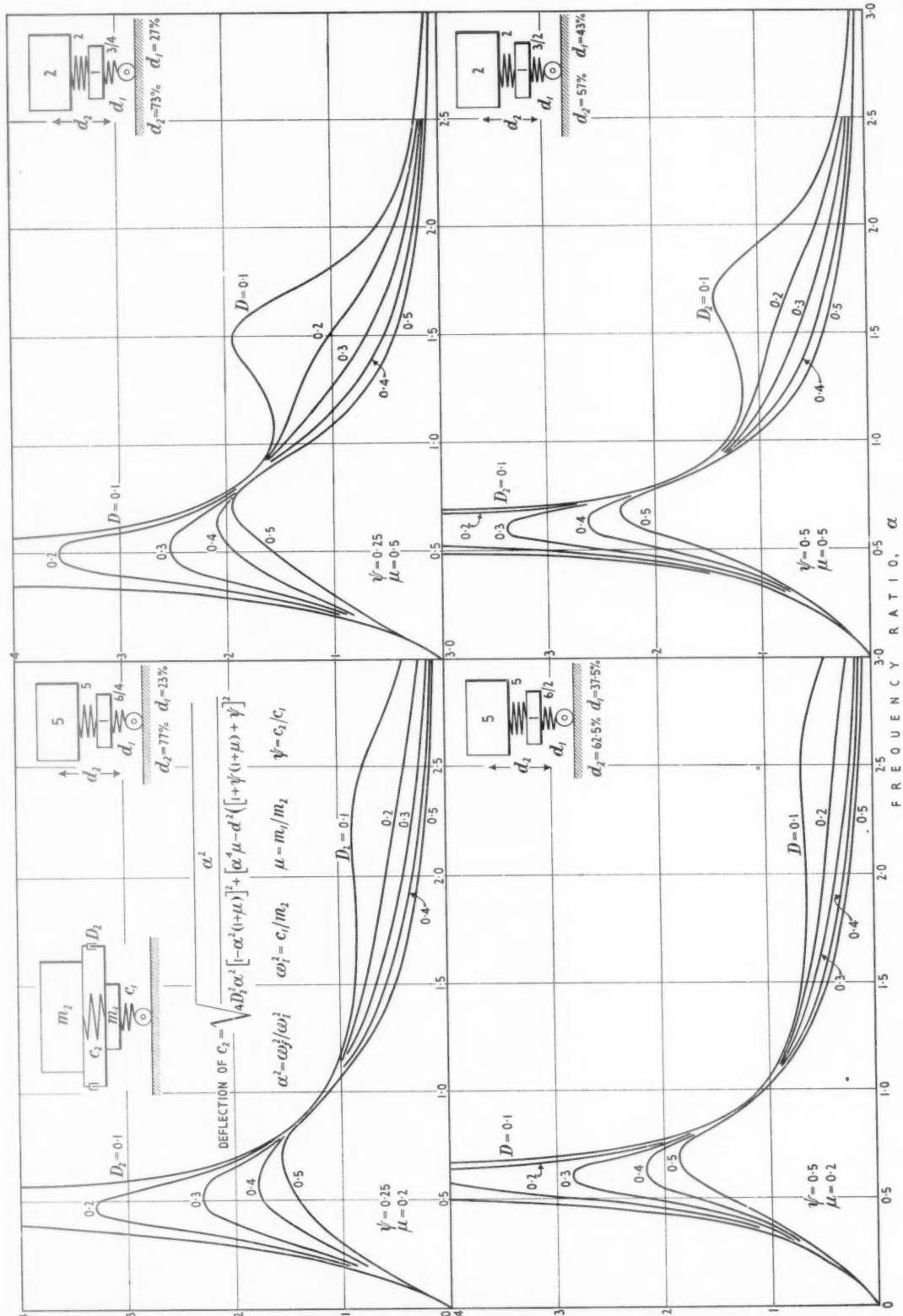



*Fig. 4—Effect of spring stiffness, mass ratio and bolster damping factors on the deflection of bolster springs*

of rail bending, the stress wave due to the wheel moving with it (9). As the speed increases, the mass of the rail, etc., will come into action resulting in lower deflection magnitudes. As the latter are measured to indicate stress this may approach a finite magnitude at a certain speed, while the rise of actual contact stresses with speed might follow a different course.

So far, the problems associated with dynamic wheel-loads have been considered solely from the point of view of track-loads. In terms of vehicle performance, it is necessary to consider the possibility of achieving optimum design solutions. This aspect of the matter will be briefly considered.

To simplify calculations dampers will be assumed to be present across the bolster suspension only. Also, to limit the scope of the considerations, only typical configurations will be dealt with. A perusal of data relating to modern rolling-stock suggests that, for carriages, the ratio $\mu = m_1/m_2$, where $m_1$ is the sprung bogie mass and $2m_2$ the mass of the body, varies between 0·1 and 0·34 with 0·2 as a fair average. Similarly, for electric or diesel-electric bogie locomotives, $\mu$ varies between 0·1 and 1·1, the average values here being 0·2 and 0·5. The ratio of spring stiffness $\psi = c_2/c_1$, where $c_1$ is the stiffness of the primary suspension of one bogie and $c_2$ the stiffness of the secondary suspension of one bogie, for carriages varies between 0·34 and 1 with 0·5 as a fair average, while for bogie locomotives this value varies between 0·25 and 0·75, both 0·25 and 0·5 being representative values. With the aid of the necessary equations, which apply to bouncing only (14), it is possible to obtain the dependencies plotted in Figs. 3 to 6. The influence of the variables on the vertical displacement of the vehicle body in terms of the effective wheel displacement are plotted in Fig. 3.

### Passenger Vehicles

In the case of passenger vehicles, comfort is generally of prime importance, so that here body displacement characteristics would be of over-riding importance. It will be noted that for $\mu = 0{\cdot}2$ best results will be obtained with $\psi = 0{\cdot}25$, *i.e.*, some 70 to 80 per cent of the total static deflection being allocated to the bolster springs. Also, as mentioned previously (13), the damping factor should have a value of about 0·2 to 0·25 of the critical value. While the difference between some of the curves might on first sight not appear as great, it must be stressed that in the frequency range concerned comfort will depend on the magnitudes of accelerations, i.e., displacement times the square of the frequency. If replotted on this basis, the difference will increase rather substantially.

The other aspect of the problem is shown by the curves, Fig. 6, of the dynamic deflection of the primary springs indicative of the dynamic load augment due to the sprung vehicle masses. To obtain the actual loads the magnitude of the wheel displacement must be multiplied by the magnitude of transmissibility, the product multiplied by the spring rate, and the results plotted along the lines of Fig. 1. It will be noted from Fig. 6 that, to reduce the dynamic load augment, it might pay to increase the static deflection of the primary springs of some systems at the expense of bolster spring softness, particularly with high $\mu$-values. The desirability of maintaining damping factor values of 0·2 to 0·25 is

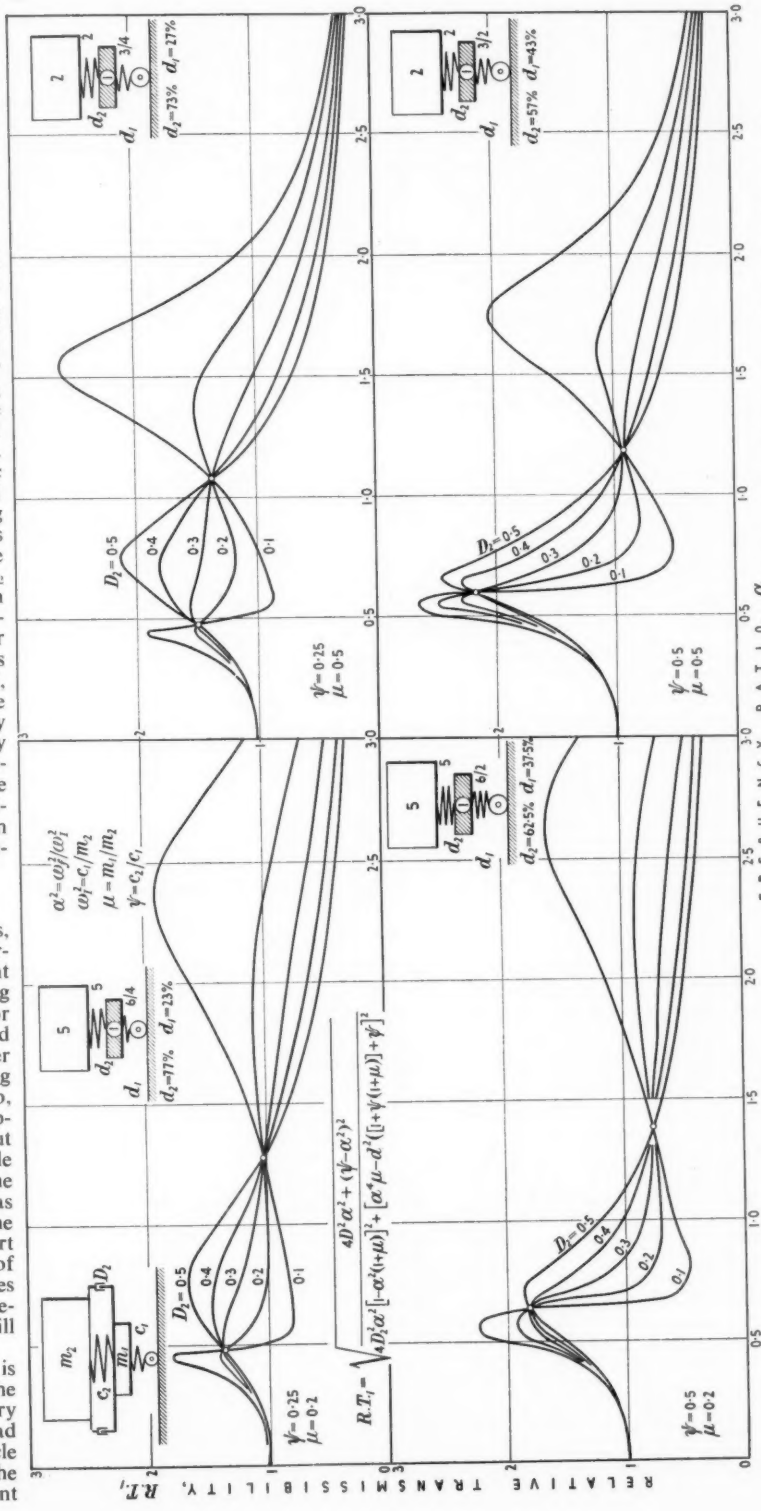



*Fig. 5—Effect of spring stiffness, mass ratio and bolster damping factors, on bogie frame displacement relative to the ground*

apparent. Data relating to deflection characteristics of the bolster springs are plotted in Fig. 4; this should be of assistance when considering dynamic deflections, while the displacements of the sprung bogie components, i.e., frame, brake gear, etc., relative to the ground are plotted in Fig. 5. A comparison of these theoretically-derived values with published experimental results (15) suggests an encouraging similarity.

The above considerations indicate that, provided the mode of excitation is known, it should be possible to determine the loads imposed by the wheels on the track as a function of speed as well as vehicle and track design parameters. The tendency to correlate the complex relations in terms of simple rules expressed in terms of $P_1/D$ (axle-load/wheel diameter) is understandable, but it can affect adversely the whole field of

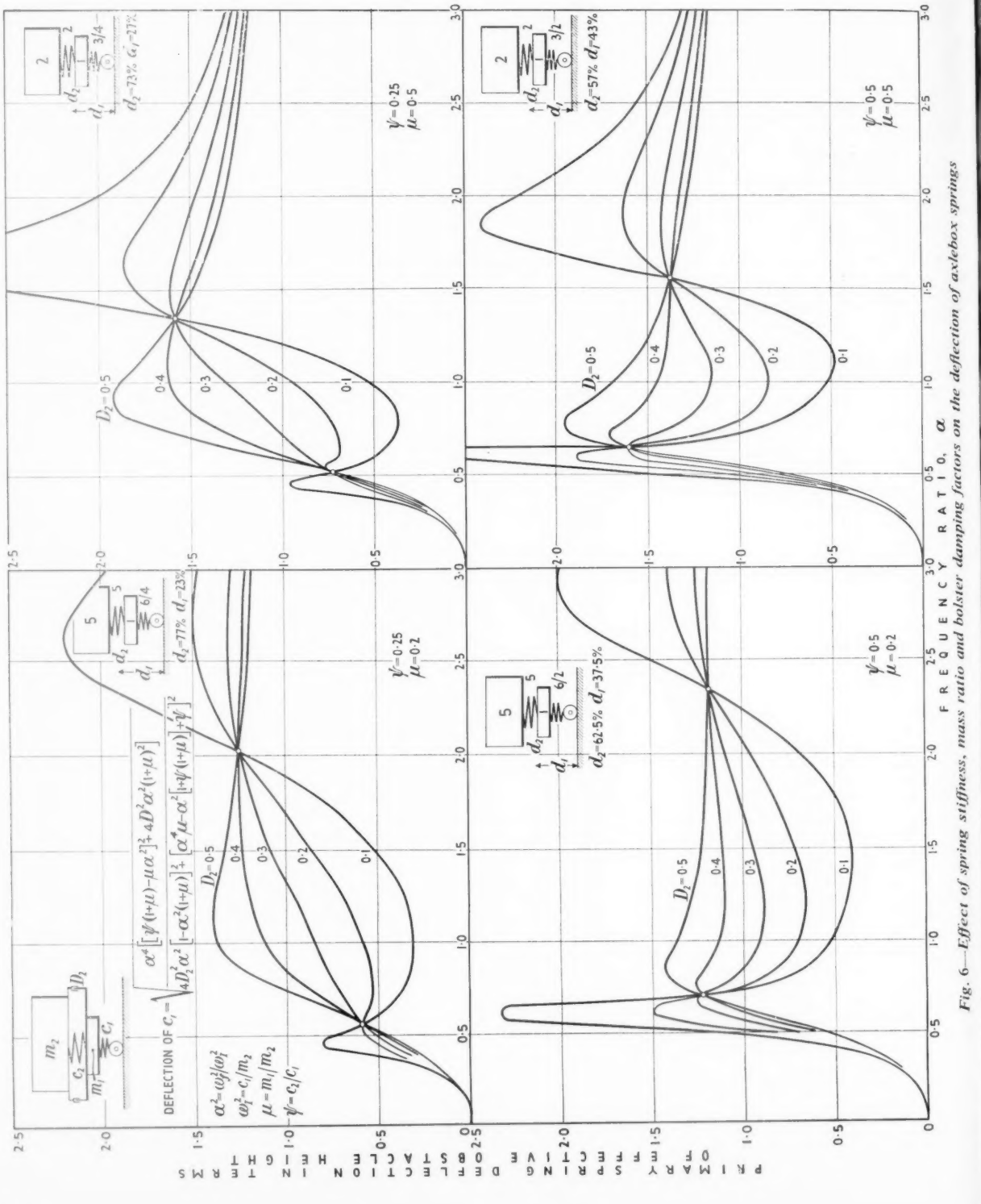



*Fig. 6—Effect of spring stiffness, mass ratio and bolster damping factors on the deflection of axlebox springs*

vehicle design and railway economics. The suggestion implied in an admittedly generalised $P_1/D$ relation that the stresses imposed on the rail will decrease in inverse proportion with the wheel diameter is not strictly correct, while on the other hand increasing the wheel-diameter leads to difficulties, particularly with electric locomotives where current collection requirements set close limits to the roof height. Increasing the wheel diameter not only will increase the unsprung weight, but also will increase the moment of inertia of the bogie about the vertical axis. This in turn will increase the magnitude of the lateral impact (13) and with it the possibility of rail-corner shelling.

In any case this conception stated as a maximum value does not allow for the rail and tyre profile changes as the result of wear, nor does it take into account the statistical aspects of the stress distribution as imposed on the rails by the wheels carrying different loads at widely-varying speeds and by trains of varying load distribution. This is of particular importance when changing the type of traction when the number of locomotives running over the track is likely to be reduced and the speeds and weights of trains are likely to be increased.

It also should be borne in mind that the rail stress pattern scarcely will be of a repetitive character, for the wheels are likely to pass at random fashion, while on the other hand the action of cold-rolling is likely to be of some benefit to the rails. The recital of these variables, as well as the various factors mentioned previously, suggests how difficult it will be to take account of them, yet further considerations must be devoted to the economic aspects of the matter. Thus, with freight stock, the possibilities of increasing the wheel diameters to meet $P_1/D$ requirements are rather limited, and reducing the maximum axle-loads would be one way out. This will mean increasing the number of axles to carry a given payload, thus adversely affecting the dead weight of the train. Generally, the higher the permissible axle-load the smaller will be the number of wagons used and also the number of wagon-miles or axle-miles run. This will reduce the number of trains required and will in turn permit an increase of scheduled speeds, and with it improved rolling-stock use. In addition, the work dissipated in shunting also will be reduced as the required locomotive-hours depend mainly on the number of wagons handled. Because the tractive resistance in part is reduced with increasing axle-loads, fuel consumption also will be affected, so that, overall, undue limitation of axle-loads can result in increased operating costs.


### Acknowledgments

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*Fig. 6—Effect of spring stiffness, mass ratio and bolster damping factors on the deflection of wheel springs*

## The A.D. Rail Fastening for Concrete Sleepers

(*Concluded from page* 359)

the ballast. These holes can also be used for fixing A.T.C. apparatus, if required, without using special sleepers.

### Improved Re-laying Methods

"F" concrete sleepers, delivered in trainloads to the permanent way depot, are unloaded on to assembly grids, where, with 30-ft. 109-lb. flat-bottom rails, they are prefabricated into 30-ft. track sections; 30-ft. service rails, with the rail fastening components, are stacked adjacent to the grids. Both sleepers and rails are placed in their relative positions by an overhead travelling gantry crane. The rail fastenings are fitted by hand and final tightening of the flanged nuts is by air-operated impact wrenches.

The prefabricated sections are then loaded by the overhead gantry into track carrying wagons which are made up into trainloads for moving to the renewal site. Up to 1,200 track-yd. can be carried in one train.

When possession of only the one line to be renewed is available, as is likely to be the case more frequently in future traffic conditions, the old track is removed in sections, usually 60 ft., and replaced by new 30-ft. concrete sleepered sections laid in by the Morris tracklaying train. When this is used, it is necessary for a self-propelled trolley fitted with two powered circular saws to follow the ballast drag and cut the ends of the old sleepers to 8 ft. 5 in. for handling through the Morris train.

When possession of two tracks can be obtained, the old track is removed by a travelling rail crane and the new track laid in by a twin-jib tracklaying crane. By this method the twin jib crane has to lay twice as many 30-ft. sections as the travelling rail crane removes 60-ft. sections; but because of the faster rate of laying by the twin jib crane, a reasonable balance between the two units is attained and average speeds of laying of 170 track yd. per hr. are achieved. New ballast is then tipped from a ballast train of hopper wagons to give additional track lift, fill in the beds between the sleepers, and provide a 12-in. shoulder of ballast outside sleeper ends.

The new track is then lifted to final level by track jacks and slewed to final alignment by steel bars. The ballast under the sleepers and for about 9 in. on either side of each rail, is consolidated by a ballast tamping machine.

After the new fabricated track has been laid for a week, the temporary service rails are removed and 300-ft. long welded rails substituted. The latest, and somewhat novel method, adopted in this operation was described in our issue of November 21, 1958.

The A.D. fastenings, except bolts and locking pins, have to be removed from the short service rails to permit the rails being tipped manually into the 4-ft. way, and replaced after the long-welded rails are laid in. The unscrewing and re-tightening of the flanged nuts is by impact wrenches powered by small mobile air compressors.

Short service rails, after being carried out manually into the 6-ft. way, or cess, are picked up by small cantilevered cranes mounted on rail-carrying wagons and taken to the depot for re-use.

# Radio-Telephony Service in Paris-Lille Trains

*Connection with National Postal & Telegraph Department network by v.h.f. link*

A TWO-WAY telephone service between certain locomotive-hauled expresses on the newly electrified Paris-Lille main line of the French National Railways and the general telephone system in France will be provided from next June. The scheme was referred to in our February 6 issue. These facilities are being arranged in connection with the four five-coach sets of lightweight stainless steel stock, built by the Etablissements Carel-Fouche.

The radio link will be by phase-modulated v.h.f. transmission, a method which will eliminate much of the interference to be expected in communication with a moving train, particularly on an electrified line. Transmitter/receiver equipment, both in the trains and at the fixed stations, is being supplied by the Compagnie Générale de T.S.F. (C.S.F.). A chain of eleven radio stations at an average spacing of 15½ miles has been set up along the route. At this interval there is a large overlap between the service areas of adjacent transmitters. The aerial masts vary in height between 98 and 196 ft. according to the ground contours, and each supports two 18-in. dipoles beamed in opposite directions along the line of route by means of dihedral reflectors. The same aerials are used for transmission and reception, and a difference of 4·6 or 4·8 Mc/s between the transmitting and receiving frequencies allows duplex working so that users of the system can converse in exactly the same way as on an ordinary telephone circuit. A shelter at the foot of each mast houses a C.S.F. Type MF 831 transmitter/receiver. Similar equipment is being provided for installation in the trains.

### Transmission Frequencies

Two transmission frequencies are used from the fixed stations, 160·6 and 160·8 Mc/s. allotted alternately so that adjacent stations are on different frequencies. All stations are connected by a two-pair cable to a repeater station at the Gare du Nord, Paris, which is linked in turn with the postal network via the Roquette exchange. One cable pair feeds the fixed transmitters through line amplifiers at each site and the other connects the fixed receivers with the Paris repeater station.

Train equipment will consist of a transmitter operating on 156 Mc/s and two receivers tuned respectively to the two fixed station transmitting frequencies. An electronic switch will ensure that signals are always taken from the receiver tuned to the frequency giving the more favourable reception at a given moment, the changeover being effected automatically when the field strength of the alternative frequency has exceeded that of the calling station by a given value for a definite period.

The system of calling to or from the trains depends on the use of certain audio-frequency tones modulating the transmitter outputs. When no messages are passing, a 1,400-cycle "system free" tone will be transmitted continuously by the fixed stations. On receipt of a call from a telephone subscriber for one of the trains, the operator at the Roquette exchange will insert a jack into one of two sockets according to whether an up or a down train is to be called. This will have the effect of applying a positive or negative potential to the cable pair connected to the fixed transmitters, causing these to radiate a tone of 1,800 or 2,400 cycles. Train equipments will be set up to respond to one or other of these frequencies, and will not operate until the appropriate one has been received. Of two trains in transit at a given time, only one at a time can receive and transmit messages.

Similar calling frequencies will be radiated from the trains when originating a call. They will clear the system of the "system free" 1,400-cycle tone, initiate a calling signal to the Roquette exchange, and enable communication between the exchange and the caller.

### Coach Aerials

In the radio-equipped trains the middle coach of the formation will be equipped with two roof-mounted omni-directional aerials of special design, one connected to the transmitter and the other being common to the two receivers, to which it will be coupled through a pre-amplifier. The aerial assembly consists of a cylinder 7 in. high capped by a disc 11 in. in diameter and fitted with eight radial rods measuring 2 ft. 1½ in. in length. A telephone subscriber originating a call to a train will dial OBErkampf 88-00 and be connected to the Roquette exchange, where he will tell the operator whether his call is to an up or down train. The latter will insert the jack into the appropriate socket as described above, and on receipt of the signal by the train the telephone bell will ring in the bar compartment of the radio coach. Lifting the receiver in the telephone cubicle will set a timing device to record the length of the call.

A passenger wishing to make a call will apply to the bar attendant, who will obtain the number for him and then switch the call to the cubicle instrument. The user will pay on the basis of the number of three-minute periods recorded.

*Aerial tower for radio telephone service alongside main line*

# RAILWAY NEWS SECTION

## PERSONAL

Mr. F. G. Culling has been appointed Commercial Manager of the New Zealand Railways. He succeeds Mr. J. R. Barker, who has retired.

Mr. A. A. Shoebridge, M.Inst.T., Commissioner for Government Transport, New South Wales, who, as recorded in our January 16 issue, has retired, is 65. During the 1914-18 war Mr. Shoebridge served with the Australian Imperial Forces in Egypt, Gallipoli and, later, with Headquarters in London. In 1932 he was appointed Administrator of the Road Transport Branch, of the Transport Department, which was responsible for the registration and licensing of drivers and motor vehicles. He was Assistant Commissioner, Transport Department, from 1944 to 1950, when he was appointed Commissioner for Government Transport, the position from which he retired on January 13. Mr. Shoebridge is a member of the Institute of Transport, London, and a foundation member of the New South Wales Branch of the Institute. He was Treasurer of that branch, from 1935 to 1945, and Chairman from 1945 to 1947.

*Mr. A. A. Shoebridge*
Commissioner for Government Transport, New South Wales, 1950-59

*Mr. W. L. Carter*
Appointed Commissioner for Government Transport, New South Wales

We regret to record the death on March 21, at the age of 81, of Sir James Williamson, Managing Director of the Bengal & North Western Railway from 1937 to 1943.

Mr. R. G. Grout, Chairman & Managing Director, General Steam Navigation Co. Ltd., has been elected President of the Institute of Transport for 1959-60.

British Transport Docks announce the following appointments: Mr. H. M. Mitton, Portmaster, Grimsby & Immingham Docks, to be Chief Administrative Officer, Headquarters; Mr. G. D. Fleming, Assistant Principal Administrative Officer, Headquarters, to be Administrative Officer.

A Criminal Investigation Department is being formed by the British Transport Commission as part of the reorganisation of its Police Force. The following officers have been appointed: Mr. W. O. Gay, Chief of Police, North Eastern Area, York, becomes Chief of Police (Crime), Euston; Mr. M. G. Phillips, Detective Chief Superintendent, Bristol Constabulary, becomes Assistant Chief of Police (Crime), and Mr. J. Lawrence, Chief Constable, County Borough of Reading, becomes Chief of B.T.C. Police, Southern Area, also located at Euston. All the appointments operate from April 1. Editorial reference to the new C.I.D. is made elsewhere in this issue.

Mr. M. F. Barnard has been re-elected President of the Mansion House Association on Transport. Other Officers also re-elected were: Mr. J. W. Bannard, Vice-President: Mr. L. A. Castleton, and Mr. B. V. G. Lewis, Members of Council.

Mr. W. L. Carter, Deputy Commissioner for Government Transport, New South Wales, who, as recorded in our January 16 issue, has been appointed Commissioner for Government Transport, joined the Railway Department at the age of 13. Apart from service in the Navy during the 1914-18 war, Mr. Carter worked continuously in different positions in the Office of Solicitor for Railways until he transferred, in 1931, to the State Transport Co-ordination Board, as Regulations Officer. For a while he was Personal Clerk to the Chief Commissioner for Railways & Tramways and, in 1932, he became Personal Clerk to the Commissioner for Road Transport & Tramways. In 1940, he became the Secretary to the State Liquid Fuel Control Board and assisted with the introduction of petrol rationing in New South Wales. Later that year he was appointed Assistant Secretary of the Department. He became Assistant Chief Traffic Manager, in 1943, and Chief Traffic Manager, in the following year. He was appointed Chief Traffic Manager of the Department of Government Transport in 1945, and also has acted as Deputy Commissioner for the past eight years. Mr. Carter has a keen interest in wireless telegraphy and was instrumental in introducing two-way radio control in the Department's vehicles.

*Mr. W. H. Scutt*

District Traffic Superintendent, Southampton, Southern Region, 1951-59

*Mr. A. C. J. Payne*

Appointed District Traffic Superintendent, Southampton, Southern Region

*The late Mr. A. E. Wells*

Assistant Secretary, Local Committee, Central Argentine Railway, 1928-33

Mr. W. H. Scutt, District Traffic Superintendent, Southampton, Southern Region, British Railways, who, as recorded in our February 20 issue, retires on March 31, joined the South Eastern & Chatham Railway at Dover in 1908. After 15 years at various stations, and as a relief clerk, he was transferred to the District Office at Ashford. He served in the District Offices at Ashford, Dover, and London Bridge until 1931, when he was appointed as Stationmaster, Birchington. He then served as Stationmaster and Relief Stationmaster, at various places, until appointed Senior Assistant Stationmaster, at Victoria, in 1940. In 1944, he was transferred to the London East Division as Acting Assistant Divisional Superintendent, and subsequently was appointed Assistant to the London East Divisional Superintendent. Later he became Assistant London East Divisional Superintendent. He was transferred to the London West Division, as Senior Assistant District Traffic Superintendent, in 1947. He became District Traffic Superintendent, Southampton, in 1951. Mr. Scutt is a member of the Institute of Transport, and, last year, was Chairman of the Southern Section of the Institute. He is a member of Southampton and Poole Harbour Boards and Lymington Harbour Commission.

Mr. W. O. Alexander, Assistant Research Manager, Metals Division, Imperial Chemical Industries Limited, and Mr. F. Dickinson, Manager, Development & Research Department, Mond Nickel Co. Ltd., have been elected to the Council of the Institute of Metals.

Mr. J. R. Greenwood, Chairman & Managing Director of Craven Brothers (Manchester) Limited, whose death, on March 14, was recorded in our March 20 issue, was 72. He started his career as an engineering apprentice at the age of 14. In the early 1920s he became a director of the Combustion Engineering Works at Derby, and in 1929 became Managing Director of Craven Brothers Limited. Seven years later he was appointed to the joint position of Chairman & Managing Director. He was a former president of the Manchester Engineering Employers' Federation.

Mr. A. C. J. Payne, O.B.E., M.M., E.R.D., Freight Assistant, Line Traffic Manager's Office, South Eastern Division, Southern Region, British Railways, who, as recorded in our February 20 issue, has been appointed District Traffic Superintendent, Southampton, began his railway career in 1919, after nearly four years' active service in the forces. He had experience at Headquarters in Staff, Passenger Rolling Stock and Rules Sections, before being appointed Assistant to the Western Divisional Superintendent, in 1934, and to the London Central Divisional Superintendent, in 1937. From 1928 to 1934, Mr. Payne was an instructor in signalling, rules & regulations at the Southern Railway Training School. He also lectured at the University College of Southampton on Railway Operating. As a member of the Supplementary Reserve, he served, during the 1939-45 war, in Movements & Transportation, Royal Engineers, in France, Egypt, Palestine, Syria, Iraq, Italy and Belgium, attaining the rank of Colonel, in 1943. In 1942 he was awarded the O.B.E. (Military), and in the same year, whilst on active service, he was promoted to be Assistant Divisional Superintendent, London East Division. In 1949 Mr. Payne accompanied Mr., now Sir John, Elliot to Australia to investigate transport in Victoria. After serving as Principal of the residential Training College, Woking, from its inception in 1946 until 1950, he was attached to the Southampton District Office until July, 1952. He was then appointed Assistant District Traffic Superintendent, Orpington, responsible for the commercial activities of the district. He was appointed Freight Assistant, Line Traffic Manager's Office, South Eastern Division, last October.

Mr. B. G. Fitzsimon has been appointed Production Engineer at the Brighton plant, West Instrument Limited.

Mr. J. C. Duckworth has been appointed Managing Director of the National Research Development Corporation. Mr. Duckworth, who is at present Chief Research & Development Officer, Central Electricity Generating Board, will take up his new appointment on April 1.

We regret to record the death, at the age of 79, of Mr. A. E. Wells, Assistant Secretary, Local Committee, Central Argentine Railway, from 1928 to 1933. Mr. Wells received his preliminary training with the Midland Railway of Great Britain, and went to the Central Argentine Railway in 1902. Until 1905, he was attached to the Traffic Department, serving in various clerical positions, as Stationmaster and as Relieving Traffic Inspector. Subsequently he was selected as Secretary to the General Manager, a position he held until 1923. Mr. Wells then became Personal Assistant to the General Manager. He was appointed Assistant Secretary, Local Committee, from 1928 until his retirement in 1933.

Mr. James Lauchlan, an Executive Director of Craven Brothers (Manchester) Limited, since 1938, has been appointed Managing Director. He succeeds the late Mr. J. R. Greenwood, who was also Chairman. Mr. F. W. Green has been elected to the board.

Mr. Duncan H. Foulds, Commercial Manager, British Road Services, has been appointed Divisional Manager, Pickfords Division, B.R.S. He succeeds Mr. Charles Bostock who retires on April 1. Mr. Foulds was Managing Director of Carter Paterson & Co. Ltd., from 1949 to 1950, when he was appointed Deputy Chief Traffic Officer (Commercial), Road Haulage Executive. In January, 1957, he became Commercial Manager of British Road Services. Mr. Foulds is a director of B.R.S. (Contracts) Limited, and Chairman of the Boards of the London and Belfast Companies of Anglo-Continental Container Services. Mr. Bostock joined Pickfords Limited in 1927, and shortly afterwards became Company Secretary. He was appointed Secretary of the parent company, Hays Wharf Cartage Co. Ltd., in 1933, and of Carter Paterson & Co. Ltd. in 1947. In 1948 he became General Manager of the three companies. His appointment as Divisional Manager, Pickfords Division, B.R.S. dates from 1950. Mr. Bostock is a member of the Institute of Transport and has been a Member of Council of that body.

*Mr. G. Byrne*
Appointed Commercial Manager, C.I.E.

*Mr. J. J. O'Dwyer*
Commercial Superintendent, C.I.E., 1951-59

*Mr. D. Delaney*
Appointed Commercial Superintendent, C.I.E.

Mr. G. Byrne, who, as recorded in our February 13 issue, has been appointed Commercial Manager of the Coras Iompair Eireann, was born in Dublin. His transport career began with the Great Southern Railways, in the Provincial Bus Service Section. After service in the North Wall Goods Depot and at Kingsbridge headquarters, he was selected for an Executive Cadetship in 1945. During the next four years he was trained in many branches of transport, including goods yard working and liaison duties, with sugar-beet companies, and as acting District Superintendent, Galway, and Assistant Goods Agent. In 1949, Mr. Byrne took over the Traffic Development Section of the Traffic Manager's Department. The section developed special wagons and other equipment for many different traffics.

Mr. R. G. Soothill, Deputy Chairman, Turner & Newall Limited, has been appointed Chairman in place of the late Sir Walker Shepherd. Mr. R. M. Bateman has been appointed Deputy Chairman.

Mr. T. Sanderson, General Works Manager, and Mr. J. Laird, Commercial Manager, of the Workington Iron & Steel Company, have been appointed to the board. Mr. J. N. St. George Curwen, Mr. Langton Highton and Mr. D. R. Wattleworth have retired from the board of that company and from the boards of the Workinton Harbour Dock Company and the Cumberland Storing Company. All three companies are subsidiaries of the United Steel Companies Limited.

INSTITUTION OF CIVIL ENGINEERS

The following names have been entered on, or transferred in, the register of Members of the Institution of Civil Engineers:—

*Members*

Mr. A. F. Daniell, Messrs. Rendel Palmer & Tritton.

Mr. N. N. B. Ordman, Divisional Engineer, Port of London Authority.

*Associate Members*

Mr. P. J. Clarke, Ministry of Works & Transport, Western Region, Nigeria.

Mr. R. T. Collier, Sir Alexander Gibb & Partners (Africa) Limited

Mr. J. J. O'Dwyer, Commercial Superintendent, Coras Iompair Eireann, who, as recorded in our February 13 issue, has retired, was educated at the Mount Sion Christian Brothers School, Waterford. Mr. O'Dwyer joined the Great Southern & Western Railway at Waterford in 1912. He served at various stations in the Waterford Area until 1916, when he moved to the Traffic Manager's office at Dublin. He became Commercial Superintendent in 1951. Mr. O'Dwyer was one of the first Irish members of the Institute of Transport, and he has been Chairman of the Irish Railway Clearing House Traffic Officers' Committee for the past two years.

We regret to record the death, at the age of 90, of Mr. William Strachan, Belfast Harbour Commissioner, 1931-53.

Mr. H. E. Hampton, has been appointed Advertising Manager, Canadian National Railways.

Mr. Max H. P. A. Le Vie, has joined F. H. Lloyd & Co. Ltd., as Product Design Engineer.

Mr. J. W. Wimpenny, Joint Managing Director & General Manager, W. H. Dorman & Co. Ltd., is making a coast to coast business tour of Canada.

Mr. J. F. Bickerton, District Engineer, Cardiff, Western Region, British Railways, has been appointed District Engineer, Newport.

We regret to record the death, at the age of 73, of Mr. A. E. Webster, Director & General Manager, Hants & Dorset Motor Services Limited, 1947-49.

Mr. N. G. Bennett, Chief Engineer, and a Director, Graviner Manufacturing Co. Ltd., has been elected a joint Managing Director.

Mr. J. B. Manson, Assistant District Engineer, Stratford, Eastern Region, British Railways, has been appointed District Engineer, Peterborough, in succession to Mr. J. H. Glendinning, who has retired.

Mr. D. Delaney, who, as recorded in our February 13 issue, has been appointed Commercial Superintendent, Coras Iompair Eireann, was born in Dundrum, County Tipperary. He entered the Great Southern & Western Railway, in 1919, and served in several stations on the system, before joining headquarters in 1931. Mr. Delaney has specialised in freight charging. He will be responsible for the system of "Package Deals," to which editorial reference was made in our January 16 issue.

Mr. W. E. Vesey, Chairman & Managing Director of Christie & Vesey Limited, has been elected President of the Timber Trade Federation of the U.K. Mr. Vesey was Chairman of the Railway Sleeper & Pole Section of the Federation, 1939-55.

TRANSPORT USERS' CONSULTATIVE COMMITTEE, LONDON AREA

The term of office of the Transport Users' Consultative Committee for the London Area has expired. The Minister of Transport & Civil Aviation has appointed a new committee, which will serve until February 28, 1962. Mr. L. G. Burleigh will be Chairman, and Mr. M. G. Tippet, Secretary. The following will be members:—

*Representing Industry*

*Mr. F. G. Varcoe, *Mr. R. A. McNeile.

*Representing Commerce*

Mrs. A. E. O'Connor, Mr. H. T. Parkin, Mr. A. R. Moore, *Mr. I. R. Mason.

*Representing Shipping*

*Mr. H. L. Carey, *Mr. D. T. Harrison-Sleap.

*Representing Labour*

Mr. A. R. Akers.

*Representing Local Authorities*

Mr. G. Allison-Beer, *County Councillor F. Brown, *County Alderman W. J. Lipscombe, J.P., *Alderman E. W. Turner.

*Representing the B.T.C.*

Mr. F. G. Crabb, Mr. G. J. Dickins.

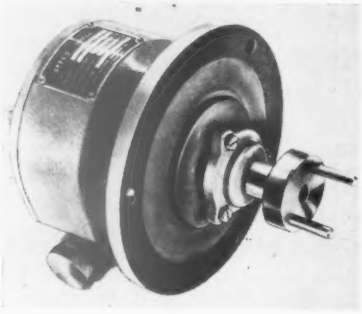
*Additional Members*

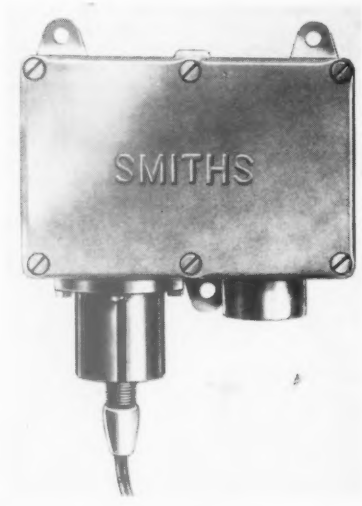
Alderman Mrs. E. H. R. Oldfield, Mrs. D. Robinson.

Two members, one to represent labour and the other to represent local authorities, have yet to be appointed.

*Indicates New Member.

# NEW EQUIPMENT AND PROCESSES






## Speed, Pressure, and Temperature Switches

THREE new switches have been developed for petrol and diesel engines by Smith's Industrial Instrument Division.

The S.S.D. speed switch operates shutdown electrically before speed rises to a dangerously high level because of failure of governor equipment. Provision can be made for isolating the starter once the engine has fired. Speed range is from 150 to 3,300 r.p.m., mounting is by direct or flex drive, and contact rating is 5 A. at 250 V. a.c.

The P.S.D. pressure switch operates shutdown electrically before pressure falls to a dangerous limit because of oil pump failure, lack of oil, or clogged oil lines. A warning signal either visual or audible can be in the circuit. Pressure ranges are 5 to 30 lb. per sq. in. or 30 to 60 lb. per sq. in. Maximum pressure is 200 lb. per sq. in. Maximum differential between warning signal and shutdown signal is 6 lb. per sq. in.

The T.S.D. temperature switch operates electrically before temperature rises to a dangerous limit because of a broken fan belt, leaks in the cooling system, or a water pump failure. A warning signal, either visual or audible, can be included in the circuit. Temperature range is from 70 to 95 deg. C. Maximum differential between warning signal and shutdown signal is 2 deg. C. The mechanism will "fail safe" in the event of damage.

Further details can be obtained from Smith's Industrial Instrument Division, Chronos Works, North Circular Road, London, N.W.2.

## Resin-Impregated Fabric

RESNIT is a resin-impregnated knitted fabric which can readily be moulded during formation without tailoring or other preliminary operations. Pressing tools used are similar to those used in sheet metal work except that they can be of lighter construction and provided with means for heating to a temperature in the region of 160 deg. C.

Possessing two-way stretch characteristics, Resnit can be heat-softened to form shapes sometimes unattainable by sheet metal. It is lightweight and corrosion-free. Its plasticity during formation permits flange areas to be reduced or eliminated so that trim scrap is negligible. Small pieces of uncured sheet left from blanking operations can be used for compression or dough-moulding other components. A final yield (on purchased material) of 85 per cent is claimed to be possible.

The process is claimed to be suitable for switchgear, industrial lighting components, refrigeration casings, and body components and panels for cars, vans, and tractors. The illustration shows the formability of the material. The surface finish obtained was governed purely by the surface of the mould.

Further details can be obtained from Leicester, Lovell & Co. Ltd., North Baddesley, Southampton.

## Casting

A NEW casting process has resulted in the development of new moulding and coring methods, superior finish and strength, overall economies, and faster operation.

A patented compound completely eliminates the drying previously required for oils used in sand-binding. Fine-grain sand mixes can be used for both moulds and cores.

Excellent results are claimed for the new process. The fine-grain and near-glazed surfaces of the moulds and cores impart a surface finish greatly superior to that of castings made by conventional means. This, and excellent strip, reduces dressing to a minimum. Machining costs and tool refurbishing and replacement are minimised and some machining eliminated.

Because of the economies possible in these respects, the company has not found it necessary to pass the increased manufacturing cost of the new process on to its customers. Further details can be obtained from the Alston Foundry Co. Ltd., Alston, Cumberland.

## Surface Protection

EXPAFLEX is a coating especially suitable for the protection of metal surfaces subject to severe conditions of corrosion and for strongly alkaline surfaces.

Advantages claimed for the product are: high chemical and corrosion resistance; hardness and flexibility; quick-drying properties; water-resistance; non-inflammability (when dry), mould-resistance; adaptability for application by brush, sprays, or dip; good storage life (except aluminium); resistance to "skinning"; general suitability for all surfaces. The product can be supplied in all colours, pastel shades, and white.

On smooth surfaces, approximately 1 lb.

to 32 sq. ft. of primer is required, approximately 1 gal. to 50 sq. yd. of undercoat, and approximately 1 gal. to 50 sq. yd. of finisher. Flashpoint of the primer is above 73 deg. F. Drying times of undercoat and finisher are: "touch dry" after 30 min., firm and hard in 24 hr. Temperature resistance of undercoat and finisher is up to 180 deg. F. (wet heat), and up to 212 deg. F. (dry heat). Flashpoint for the brushing grade is 84 deg. F., and for the spraying grade, 75 deg. F.

Further details can be obtained from Expandite Limited, Chase Road, London, N.W.10.

## Automatic Welding

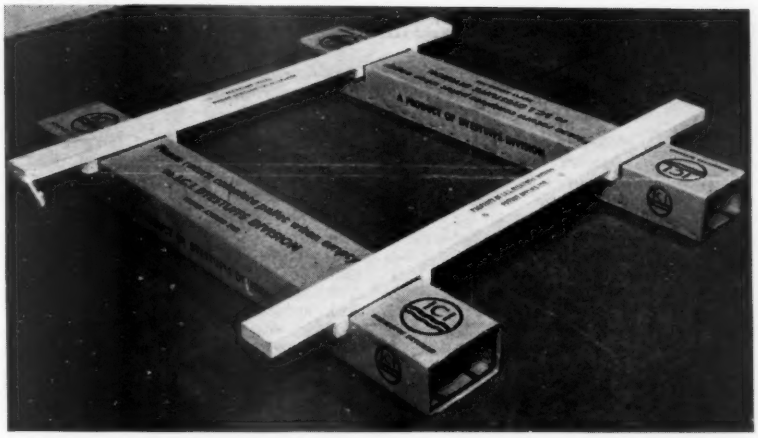
THE "Muramatic" welding equipment incorporates an automatic welding head and control cabinet. The head can be mounted on many different devices and used in the form of a single- or double-headed deckwelder mounted on booms, columns, mobile platforms, etc. All necessary equipment is available to enable a complete installation to be arranged to fit in with production requirements.

The head has been designed for use with submerged- or open-arc processes using a.c. or d.c. supply and welding currents up to 1,200 A. Attached to the head is the control panel with all electrical controls and instruments grouped together to facilitate current, voltage and speed to be varied as required. Mechanical adjustments in all three planes permit exact positioning of the electrode over the weld joint. A suitable angular adjustment is incorporated for fillet welding.

When used on the open-arc process, the head can be fitted with a combined arc-shield and fume-extractor hood and a special fume extractor fan. For submerged-arc work, a flux hopper is incorporated instead of the hood and extractor.

A separate cabinet houses the main control contactor and auxiliary power supply circuit. The cabinet is connected electrically to the head by multi-core flexible cable.

A deckwelder carriage has a standard speed range of 8-40 in. per min. in either direction. The equipment is fully steerable and power drive to the wheels can be disengaged. Wheels are grooved to enable the carriage to run on a track.



The equipment can be supplied suitable for operation in the moist heat of a tropical climate.

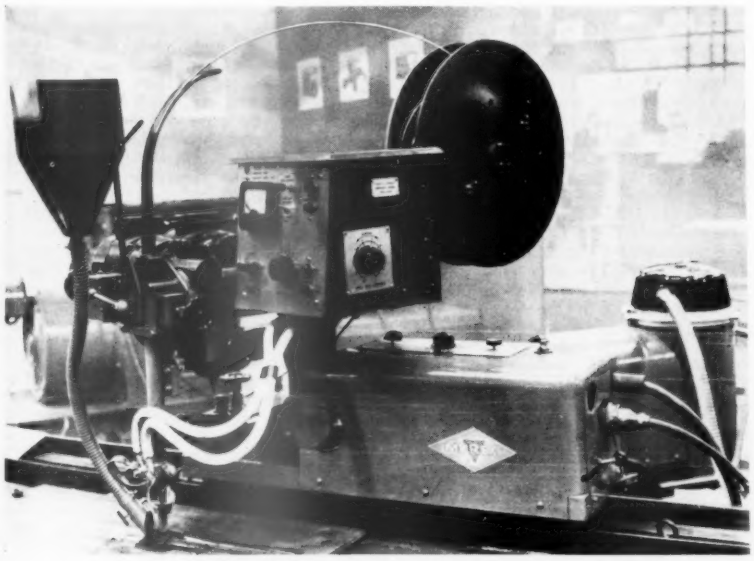
Further details can be obtained from Murex Welding Processes Limited, Waltham Cross, Herts.

## Pallet

THE "Manjute" is a cheap, lightweight rigid pallet of the sleeve type designed for fork-lift handling of paper or hessian sack-packed materials. It can also handle other types of packages provided they are flat-topped and without projections. It is collapsible for easy storage and return transport and occupies considerably less space than that needed for a wood pallet.

The two sleeves of the unit are of welded steel mesh, entry points being 6 in. × 3¼ in. The strong fibreboard covers can be printed with owner's name and address or publicity matter. Two or more wooden decks are fitted across the sleeves to form a light but robust pallet. Different sizes and additional deck pieces can be supplied according to the type and composition of the load.

Cost per unit is about 21s. Further details can be obtained from Thomas Manning Sons & Co. Ltd., Manchester, which markets the unit under licence from the manufacturer, I.C.I. Dyestuffs Division, Millbank, London, S.W.1. Patent has been applied for.



## Reversible Pneumatic Screwdriver

THE 2SR8 is a new reversible powered screwdriver incorporating a pneumatic motor claimed to provide increased power, efficiency, quiet running and long life.

The motor, which recently has been patented, is reversible and has maximum expansion in either direction.

Leakproof operation and complete sealing of all high-pressure air is claimed for the new screwdriver, which is supplied with a lever control handle and suspension bail. Different speeds are available to suit specific requirements. Slow-speed models provide high torques where this is required.

Accessories include screwdriver bits for all types of screw and a wide range of box spanners for nut-running. Hexagon bits can be supplied for driving socket-headed cap screws.

Further details can be obtained from the manufacturer, Desoutter Brothers Limited, The Hyde, Hendon, London, N.W.9.

# Ministry of Transport Accident Report

*Near Lunan Bay, September 2, 1958: British Railways, Scottish Region*

Colonel D. McMullen, Inspecting Officer of Railways, Ministry of Transport & Civil Aviation, inquired into the accident which occurred at about 10.25 a.m. on September 2, 1958, near Lunan Bay, when the 7.30 a.m. down express, Edinburgh to Aberdeen, consisting of eight bogie coaches drawn by a "V2" class 2-6-2 engine, and running at about 30 m.p.h. ran into a derailed four-wheel van, detached from the preceeding train. Warned by his fireman the driver succeeded in reducing speed to about 20 m.p.h. The train was not derailed and no one was injured. The van, athwart the down line, was driven forward about 80 yd. and heavily damaged. Both lines were blocked and the track extensively damaged. Single line working could be instituted by 4.30 p.m. and normal working by 7.40. It was clear but cloudy.

The train from which the vehicle had become detached, after being dragged derailed for about two miles, was the 7.9 a.m. express, also Edinburgh to Aberdeen, consisting of eight bogie coaches, one bogie motor car van and two 4-wheel covered fruit vans, and was drawn by a "V2" class engine, not fitted with a speedometer. The rearmost van had a 10 ft. wheelbase and was fully fitted with vacuum brake. Built in 1950, it underwent general repair in 1956 and was authorised to run in passenger trains. The van ahead of it was similar.

The line was falling at about 1 in 100 at and near the point of derailment; from Inverkeilor station 2¼ miles from the point of collision, and thence to Lunan Bay, half mile beyond, the line is mainly curved. The van became derailed to the 6-ft. way on a 40-ch. left-hand curve, and finally became detached on a 75-ch. right-hand curve. For some distance up to the point of derailment the rails were 95-lb. bullhead. The stone ballast was dirty and clay subsoil had worked through in places; some joints were "pumping" slightly. Gauge did not vary more than $\frac{1}{16}$ in., and alignment and "top" appeared satisfactory. The rails, slightly worn, had a good profile without "side-cut." Details for 100 yd. back had been recorded and, at Colonel McMullen's request, cross level and void measurements were taken for another 100; there were small irregularities in cant and cross levels under load; they were not serious. Considerable damage was done to both lines over the length along which the colliding train pushed the van. Maximum permissible speed at the point concerned is 60 m.p.h.

### Rules and Regulations

Operating instructions issued in April, 1957, laid down that passenger trains conveying vehicles with wheel-base less than 15 ft. must nowhere exceed 60 m.p.h. In every case where such vehicles are in the train the guard must advise the driver before starting so that such speed shall not be exceeded while these conditions obtain.

In addition, Block Telegraph Regulation 19 was relevant to this case; it prescribes the action to be taken by a signalman when a train passes him without a tail lamp; the text of this regulation is accordingly given in the report.

The vans were attached to the 7.9 train at Edinburgh; inspection of them disclosed no defect. Brake tests were duly effected. The guard noticed the 10-ft. wheelbase and informed the driver. On the journey to Dundee he several times noticed the vans to be oscillating but, he considered, not more than usual. The driver, also aware of the relevant regulation, did not think he exceeded 55 m.p.h. At Dundee the engine was changed but incoming and outgoing crews had no opportunity of speaking. The whole train was examined and no defects noticed. The guard met the one who was to take the train on but did not mention the short wheelbases nor had he recorded them in his journal, which he handed over.

### Advising Composition of Trains

The arrangements at Dundee were for a train reporter to be advised by telegram from Edinburgh of the composition of through trains and for him to advise drivers accordingly. He thought he told the driver that the two vans were 10 tonners, but he said nothing about wheelbase, not mentioned in the telegram. He assumed the driver would appreciate that the vans were of short wheelbase; he was himself aware of the relevant speed limit.

The relieving driver, 60 years of age, had been driving over this line for 21 years. He said that while waiting with his engine for the train, the train reporter shouted to him that it had 11 vehicles and weighed 280 tons. Nothing was said about vans, as the fireman confirmed, but he assumed there must be some from the weight given.

The guard said the one arriving from Edinburgh said nothing about the composition of the train. Walking to see the tail light he noticed the two 4-wheel vans but not that they had a short wheelbase. He did not give the train's detailed composition to the reporter, only the total vehicles and load; he thought it the reporter's duty to pass the information to the driver and did not go to the engine. The train left 15 min. late, but by no signalman or other person was it seen to be proceeding otherwise than normally; no undue oscillation of the vans was noticed. All wheels of the rearmost van left the rails shortly after Inverkeilor and, after being dragged for two miles, the van struck an underbridge girder, was thrown up and fell across the track. After 100 yd. more its front coupling jumped out of its gedge slot, which had become extended, but the coupling remained on the hook of the vehicle ahead; the van was now detached. The vacuum hosepipe was torn off the van ahead and the train stopped in 343 yd., out of sight of the derailed vehicle.

Although he thought maximum allowable speed here was 70 m.p.h. the driver told Colonel McMullen he had not, he thought, exceeded 60: it might have been slightly more on the falling gradient. He had no complaints about the track near Inverkeilor and felt no lurch. On many occasions he had not been told at Dundee about vans being on the rear of his train. He had always looked back but the rear vehicles had not oscillated more than usual. The fireman and guard supported these statements.

The fireman, sent back when the train stopped, met the guard and they noticed the hosepipe was missing; the front one was disconnected and the brakes released. The guard did not notice that a van was missing. Neither man saw the tail lamp was missing. They failed also to notice the torn off coupling on the now rear hook, and gave no serious thought as to why the hosepipe was missing; the fireman said he was probably excited and keen to get restarted and the guard gave the same impression.

The Lunan Bay signalbox was closed; the porter signalman went towards the stopped train and after it started the fireman shouted to him to telephone to Montrose to have a new hosepipe ready. The driver by now realised that it was strange to lose one and questioned the fireman, but did nothing more. The porter signalman did not notice the train had no tail lamp, but telephoned as desired to Montrose.

The signalman at Usan, 2¾ miles beyond Lunan Bay, whence the line is single to Montrose South box, handed the token to the train and although remaining on the platform until it had passed failed to see the tail lamp was missing. He said he was concentrating on the missing hosepipe, of which he had heard. He accordingly returned an irregular "out of section" signal to Inverkeilor, was asked "is line clear?" for the following train, which had been stopped at that station, and accepted it. Its driver started and reached about 30 m.p.h. on the up gradient of 1 in 100, then 1 in 92, which begins ½ mile beyond where the van left the rails, when the fireman saw that vehicle about 100 yd. ahead—the driver, however, thought only 30 to 40 yd.—and every effort was made to stop. This driver, asked by Colonel McMullen, was very vague about the permissible speed on the section; he thought a down express would reach 60 to 75 m.p.h. through Inverkeilor.

The signalman at Montrose South, aged 64, with 40 years as signalman, told the carriage and wagon examiner to have a spare hosepipe ready. He saw the train arrive with one small van and no tail lamp. He telephoned to the signalman at Inverkeilor and realised the Usan signalman to be on the line. He asked the former how many vans the train had and, being told one, replaced the token in the instrument, gave "out of section" to Usan. He then asked "is line clear?" for an up train and received acceptance and the release for another token with which this other train left at 10.27, 3 min. after the down train arrived. The Usan signalman said he also was asked from Montrose how many vans there were and replied one only, but when he heard the train had arrived there with no tail lamp he realised that he had missed seeing one and told the Montrose signalman so. Nevertheless, he did not decline the up train when offered.

When the guard went to replace the hosepipe he discovered the tail lamp was missing and, seeing the extra coupling hanging down, shouted to the platform foreman to advise the signalman that a vehicle had been left in section. This was done and "obstruction danger" transmitted to Usan, where the signalman had heard that the following train had stopped in section in rear of Lunan Bay, and had replaced his signals against the up train. He then heard of the collision but did not send "obstruction danger" to Inverkeilor.

The Montrose signalman admitted frankly that he had failed to comply with regulations but tried to save delay to the up train. He had, however, never been reprimanded for delaying trains and no undue pressure had been put on signalmen

to avoid them. The stationmaster confirmed this and said he had nothing to criticise about the work of this man or the one at Usan. Both had been found in December, 1956, by the district signalman's inspector, to have a sound knowledge of rules and regulations. His regular visits had disclosed no slack or incorrect working by them: he could offer no explanation of their failures.

The district locomotive inspector said that men were invariably asked, when being passed as firemen or drivers, about maximum speeds for lines over which they were likely to work but after a man had qualified as driver he was not normally examined again in rules and regulations; he could not account for lack of knowledge of maximum permissible speeds, as displayed by some footplate staff.

A ganger said the down line near Inverkeilor needed more attention than others on his beat on account of the clay foundation. He packed the sleepers at the end of July. The day before the accident four joint sleepers needed re-packing; otherwise the track was in good order.

Flanges and tyre profiles of the van were good; no spring was broken but damage made it impossible to ascertain whether spring adjustments were correct.

### Inspecting Officer's Conclusions

No doubt the derailment arose from excessive speed combined with slight track inperfections and probably some small maladjustment of the lightly loaded van springs. Calculations show the speed to have been about 51 m.p.h. when the van became detached and, from the general running of down trains on the falling gradient around Inverkeilor Colonel McMullen concludes speed at the moment of derailment to have been not less than 70 m.p.h. compared with the permissible maximum of 60 for this section and for trains including such vans. The track was safe for 60 m.p.h., and the van probably fit to run at that speed. When speeds are high, however, minor defects in items of equipment can combine to cause sufficient oscillation to derail such a vehicle; the relevant regulation is therefore important. The speed limit beyond Kinnaber Junction, three miles beyond Montrose, is 75 m.p.h., and the driver should have been informed at Dundee about the two vans. The arrangements there for doing this were not completely satisfactory and are being reviewed.

The ignorance of certain staff regarding speed limits surprised Colonel McMullen. They were required to sign a certificate—the text is given in the report—recording their thorough acquaintance with road and signals and clearly meaning that they knew the overall permissible speed limits on specified sections, a fact of which some men evidently need reminding.

The driver of the second train could not have avoided the collision. Responsibility falls firstly on the guard and fireman of the first one for failing to detect it was incomplete and, secondly, on the Usan signalman, for like reason. How the two former failed to realise the van, although out of sight, had become detached is difficult to understand; they said they were anxious to get the train moving and clearly gave no serious thought to what had occurred. The driver became suspicious, but took no action. Of considerable experience, he should have appreciated that a van might have become detached and stopped the train for further examination.

The actions of the Usan and Montrose South signalmen constitute a chapter of irregularities. The excuse offered by the former is unacceptable. When he realised his initial error he broke the regulations in accepting the up train and the other signalman, although in no way responsible for the accident, also disobeyed them. He excused himself by saying he wished to avoid detention to the up train. Punctuality is most desirable, but such unthinking actions and disregard of regulations are not the way to achieve it. They can have serious results.

## The Vulcan Foundry Limited

*Sir George Nelson's speech*

The ninety-sixth annual general meeting of The Vulcan Foundry Limited was held in London on March 19. The following is an extract from the statement by the Chairman, Sir George H. Nelson, Bt., LL.D., F.C.G.I., D.I.C., M.I.Mech.E., M.I.E.E.:—

I would like to begin by paying tribute to the late Mr. F. S. Whalley, M.C., who died in November last after some years of illness. Until his retirement from the Board in 1954, Mr. Whalley had been associated with The Vulcan Foundry for nearly forty years, including twenty years as Managing Director and five as Chairman, and the company will always be indebted to him for the wisdom, inspiration and humanity which he brought to its direction and management. He is sorely missed by his many friends, not only at The Vulcan Foundry and Robert Stephenson & Hawthorns, but throughout the locomotive industry and the railway world.

Mr. H. G. Nelson, Managing Director of the parent company, The English Electric Co. Ltd., was appointed Deputy Chairman of The Vulcan Foundry Limited and of its subsidiary company, Robert Stephenson & Hawthorns Limited, in December last.

I am pleased to say that the more favourable results which I forecast a year ago materialised during 1958, the Group trading results showing a profit of £125,780, after charging depreciation of £118,780, compared with a loss of £286,497 in the previous year. This improvement resulted from our having begun to enjoy the full benefits of the investment in re-equipment and modernisation of the workshops which, both on capital and revenue accounts, has totalled some £2,000,000 since Vulcan and Stephensons were purchased by The English Electric Co. Ltd. four years ago. In addition, to finance the growing level of production, our working capital requirement has increased by £2,000,000 over the same period.

In view of the improved results, the Directors consider there is justification for the resumption of a dividend on the ordinary stock, the whole of which is owned by The English Electric Co. Ltd., and they recommend a dividend of 5 per cent, less Income Tax.

### British Railways

You will recall that in 1957 we delivered the first diesel-electric locomotive against the British Railways modernisation programme, well ahead of our competitors, and I am glad to say that orders from the British Transport Commission are playing an important part in our production. We are naturally proud of the confidence which the Commission has shown in English Electric by giving us orders for a number of types of diesel-electric locomotive, including 3,300-h.p. locomotives powered by the Napier "Deltic" engine, as well as a.c. locomotives for the lines which are being electrified. We are also gratified at having received repeat orders for the two types of diesel-electric locomotives we had already delivered to British Railways.

I would like to place on record our appreciation of the co-operation we have received from the British Transport Commission in the planning and execution of the orders with which we have been entrusted. This co-operation, so readily given by Sir Brian Robertson and his officers and staff at all levels, has been invaluable, and we are most grateful to them for all they have done to make our collaboration so effective.

The British Railways orders, together with orders from railways overseas, now ensure that our works will be kept fully occupied during the current year, but we are constantly seeking further business so that the fullest use may continue to be made of the productive capacity we have built up.

### Overseas Markets

While we are delighted to know that we are participating so prominently in the British Railways modernisation scheme, this does not of course mean that we are neglecting our old friends in markets overseas. Indeed, last year's production of English Electric locomotives included orders built at Newton-le-Willows for Rhodesia, South Africa, and Spain, while Stephensons' Darlington Works turned out locomotives for Argentina and Malaya.

Export orders, from which in the past the bulk of our production sprang, are, however, becoming increasingly difficult to obtain in the face of keen competition from manufacturers in other countries. This situation demands minimum costs of production in the minimum time, so that our tenders may be competitive both in price and delivery. The success we are achieving is illustrated by the fact that the diesel-electric locomotive order recently received from the Sudan Railways was secured against the competition of 22 other firms, representing 11 countries.

CONFERENCE ON ORE HANDLING.—The Iron & Steel Engineers Group of the Iron & Steel Institute is to meet in Amsterdam on April 14-17 to discuss the handling and treatment of ore in Britain, on the Continent, and in North America. Installations at Rotterdam, Port Talbot, and Cardiff will be described. Visits will include the works of Royal Netherlands Blast Furnaces & Steelworks Limited at Ijmuiden.

DESOUTTER AT THE ENGINEERING, MARINE, WELDING & NUCLEAR ENERGY EXHIBITION.—Desoutter Bros. Ltd. is again showing a range of portable pneumatic and electric power tools at the Engineering, Marine, Welding & Nuclear Energy Exhibition at Olympia, London, on April 7-17. Two new pneumatic tools will be exhibited for the first time. One is a reversible screwdriver, Type 2SA8, fitted with the new Super Atom motor which is stated to produce 50 per cent more power than the Mighty Atom type, with no increase in diameter. The other is the Type M.148 Corner screwdriver and nutrunner. Both are fitted with a special silencer.

# The English Electric Group

*Sir George Nelson reviews the activities of a world-wide organisation*

The annual general meetings of The English Electric Company and its major subsidiaries in the United Kingdom were held on March 19 in London.

Sir George H. Nelson, Bart., the Chairman, in the course of his addresses, said:

Since the last meeting, Mr. Nelson, your Managing Director, has been elected Deputy Chairman of each of our principal subsidiaries in this country. I have the greatest pleasure in welcoming him back from his tour of India, Pakistan and Ceylon from which he returned only two days ago. He is much impressed with the possibilities there and feels strongly that we should collaborate as closely as possible with the development of these countries. Mr. Nelson had the honour of being received by the Indian Prime Minister, Pandit Nehru.

Mr. Nelson also visited the Middle East as Industrial Leader and Vice-Chairman of the Board of Trade Advisory Council on Middle East Trade and was most warmly received by the rulers and leaders in many countries and is impressed with the possibilities of trade development in those areas.

### The Export Position

I have referred in previous years to the difficulties which exist due to intense competition from the exporting nations of the world.

These conditions challenge us to decrease costs without losing our reputation for high quality and provide a constant spur for everybody in the organisation to increase efficiency in design and manufacture.

In reviewing the Group's activities, Sir George said:

### Traction

In the traction field we have always tried to anticipate the requirements of our own railways and of those overseas and over the years have carried out extensive research and development at our own cost. The development of the Deltic diesel electric locomotive has been an outstanding example which resulted in the receipt of an order from British Railways for 22 of these locomotives to operate intensive schedules on the East Coast route to Scotland. Other examples have been the development of a new type of bogie for electric trains, which has greatly reduced the need for lubrication and replacement or adjustment, and the development in the earlier days of our diesel electric shunting locomotive.

Some years ago in conjunction with the Southern Railway we built three electric locomotives each of 1,470 h.p., weighing 101 tons. It is an indication of the progress in our development that again in association with British Railways we are now producing 2,500 horsepower locomotives weighing only 80 tons. I will make another reference to this important business when I speak later about the Vulcan Foundry Group.

### D. Napier & Son

The results of the Napier Company last year were not unsatisfactory, the profit and output of the Company being little different from that of 1957.

The Napier Deltic diesel engine has proved successful in a number of applications, notably as the power unit in diesel electric locomotives.

### Vulcan Foundry Group

A year ago I had to report a substantial trading loss, but the more favourable results which I then forecast have materialised during 1958. The Group trading results show a profit of £125,780, after charging depreciation of £118,780, compared with a loss of £286,497 in the previous year.

In 1957 we delivered the first diesel-electric locomotive against the British Railways Modernisation Programme, well ahead of our competitors, and we are naturally proud of the confidence which the British Transport Commission have shown in English Electric by giving us orders for a number of types of diesel-electric locomotive.

Orders received from at home and abroad ensure that the works of the Vulcan Group will be kept fully occupied during the current year.

# Institution of Locomotive Engineers Visit to Derby

A party of over 200 members of the Institution of Locomotive Engineers and their guests visited Derby Locomotive Works, British Railways, London Midland Region, on March 19, and later toured the British Railways School of Transport at Derby.

At the locomotive works the party was received by Mr. T. F. B. Simpson, Works Manager. Amongst the processes inspected was the final assembly of the frames and superstructure of diesel-electric locomotives from jig-built welded fabrications. One phase of the line assembly involves pre-loading the main structure during the attachment of stress-carrying side sheets.

The first of the Type "4" 2,300-h.p. locomotives with Sulzer engines, illustrated in our last week's issue, bearing the name *Scafell Pike*, was seen undergoing final preparation in the diesel erecting shop.

### Static Full-Load Tests

In the diesel test house the visitors were shown running-up and governor checks in preparation for full-load tests on the power unit installed in a Type "2" 1,160-h.p. main-line locomotive. The equipment in this test house includes naturally-cooled Expanmet resistors supplied by the Expanded Metal Co. Ltd.

In an annexe to the diesel engine repair shop the equipment demonstrated included fuel-pump calibration and phasing machines built by Leslie Hartridge Limited and the Merlin Engineering Co. Ltd.

In the Apprentice Training School instruction was being given in a variety of machining and fitting operations and in draughtsmanship.

The party was received at the British Railways School of Transport by the Principal, Mr. J. Kirkby Thomas. The courses include management psychology, commercial practice, and diesel traction. The diesel demonstration block, erected in 1956, was shown. There, motive power officers and salaried supervisors from all Regions of British Railways are given instruction in the principles and practice of diesel-electrical control systems and fault-finding. Hydraulic transmission systems and routine maintenance work on fuel-injection equipment are taught.

The visitors were entertained to tea at the School of Transport. Mr. L. Arbuthnott, President of the Institution, thanked Mr. Kirkby Thomas, Mr. J. J. Finlayson, Assistant Mechanical & Electrical Engineer, London Midland Region, and Mr. Simpson, for their courtesy in affording facilities for the visit.

Other Members of the Institution present included: Messrs. D. C. Brown, Vice-President; A. Campbell, Past President; J. H. Cansdale, Member of Council; C. M. Cock, Past President; M. A. Crane and W. H. Dixon, Members of Visits Committee; G. T. Hart, Secretary; R. F. Harvey, Member of Council; and J. F. B. Vidal, Past President and Member of Visits Committee.

# Parliamentary Notes

### British Transport Commission Bill

For the consideration of the British Transport Commission Bill, the following House of Commons Committee was appointed on March 17: Sir David Campbell (Belfast S.—U.U.), Chairman; Mr. Frank Allaun (Salford E.—Lab.); Mr. J. C. Forman (Springburn, Glasgow—Lab.); and Mr. Godman Irvine (Rye—C.). The Committee will hold its first meeting on April 14 at 11 a.m.

# Questions in Parliament

### Effect on Fares of Closing Lines

Mr. James Harrison (Nottingham East—Lab.) asked the Minister of Transport & Civil Aviation on March 18 if he was aware that with the closing of the old M. & G. N. lines many journeys from the Midlands to East Coast towns would cost considerably more in fares owing to the extra mileage now involved; and if he will give a general direction to the B.T.C. that, in all cases where portions of main line are closed, new fares between affected localities should be assessed on the old mileage where possible and not on the greater distances.

Mr. Harold Watkinson, in a written answer: This matter would be unsuitable for a general direction. The Commission proposes to introduce reduced fare period tickets from Midland towns to certain East Coast resorts from May to October. The East Anglian and East Midland Transport Users' Consultative Committees were informed of this when they considered the closure of the lines.

### All-Metal Railway Carriages

Sir Alfred Bossom (Maidstone—C.) asked the Minister of Transport & Civil Aviation on March 17, in view of the high cost of importing wood, and the strain on national resources, if he would give a general direction to the B.T.C. to use all-metal railway carriages and freight cars.

Mr. Harold Watkinson, in a written answer: No. This is a matter of management for the Commission. Only a small proportion of timber imports is used for railway rolling stock. For many years all new passenger coaches have been built of steel, with wood used for interior fittings or panelling only. No wooden freight wagons are being built except where necessary for special purposes.

# Contracts and Tenders

*Mobile air compressors for Belgian National Railways*

The Hymatic Engineering Co. Ltd. has received an order from the Belgian National Railways for 23 mobile air compressors to the value of £10,000. The compressors, of the lightweight Hymatic Hydrovane type, will be used for emergency crash rescue work. Each compressor will power two high speed grinders. This is considered a quicker and safer method of cutting steel carriage panels than oxy-acetylene blow torches which can cause injury to people trapped in wreckage.

An order for 400 steel flat wagons has been placed with the National Steel Car Corporation by Canadian National Railways. The flat wagons will each be 46 ft. long and are designed especially for piggyback service. They are required to meet the demands of the recently expanded piggyback service across Canada. Delivery is expected to be completed by August of this year. An order has also been placed with the Canadian Car & Foundry Company, Montreal, for 125 double-deck motorcar transporter wagons. They will be delivered this year.

British Railways, London Midland Region, has placed the following contracts:—

Butterley Co. Ltd.: supply, fabrication, delivery and erection of steelwork for bridges over Randolph Street, Camden Town, N.W.1, and Caledonian Road, N.1

Leonard Fairclough: construction of footbridge and liftshafts at Sandbach Station, and renewal of roof covering, extension to Central Carriage Shed, Birkenhead

Norwest Construction Co. Ltd.: new forwarded shed and auxiliary buildings, Huskisson Goods Depot, Liverpool

Mellowes & Co. Ltd.: patent glazing renewal of roof coverings, M.P.D. Woodford Halse

British Challenge Glazing Company: patent glazing renewal of roof coverings, Motive Power Depot, Rowsley

Tysons (Contractors) Limited: new ticket office and alterations to booking hall, Hamilton Square Station, Birkenhead

Edward Wood & Sons Ltd.: warehouse for Mobiloil Company, Top Yard, Curzon Street, Birmingham

D. Lynch: demolition of house, and site work, Coventry Station.

British Railways, North Eastern Region, has placed the following contracts:—

J. W. Roberts Limited: supply and application to 150 vehicles of "Limpet" asbestos

Dow-Mac (Products) Limited: supply of concrete beams, bridge No. 43, Moor Lane, York

Tubewrights Limited: supply and fabrication of gantries for Signal Engineer

Hunting Aerosurveys Limited: aerial surveys, Healey Mills and Stourton.

The Special Register Information Service, Export Services Branch, Board of Trade, has received a call for tenders as follows:—

*From Thailand:*

5 two-car diesel railcar units (Type A, power car with luggage compartment)

5 two-car diesel railcar units (Type B, power car without luggage compartment)

1 set of driving bogies complete

1 set of trailer bogies complete

1 engine complete with starter

1 transmission equipment complete with reverse gear

1 air compressor.

The issuing authority and address to which bids should be sent is the Stores Superintendent, Office of the Stores, State Railways of Thailand, Bangkok. The tender No. is Sor. 2/20549. A deposit of Bht. 100,000 should be made by the tenderer. The closing date is April 20, 1959. The Board of Trade reference is ESB/6809/59.

8 items of wheel tyres to various specifications.

The issuing authority and address to which bids should be sent is the State Railway of Thailand, Bangkok. The tender No. is 02051. The closing date is April 8, 1959. A deposit of Bht. 14,000 is required from tenderers. The Board of Trade reference is ESB/6811/59.

*From Australia:*

139 sets of train lighting equipment for passenger coaches.

The issuing authority is the Victorian Railways. The tender No. is 61,401. Bids should be sent to the Secretary for Victorian Railways, Melbourne C.1. The closing date is April 1, 1959. The Board of Trade reference is ESB/6770/59.

*From Tasmania:*

3 sets of equipment for general service diesel locomotives, consisting of engine, transmission, and controls

3 general service diesel locomotives complete, in accordance with spec. No. 134, and full set of working drawings.

The Issuing Authority is the Comptroller of Stores, Transport Department, Railway Branch, Invermay Road, Launceston, Tasmania. The tender No. is 59/L1. Bids should be sent to the Secretary for Railways, Box 624D G.P.O., Hobart. The closing date is May 1, 1959. Copies of the tender documents can be obtained upon direct application to the Agent-General for Tasmania, 457, Strand, London, W.C.2. The Board of Trade reference is ESB/6785/59.

Further details regarding the above tenders, together with photo-copies of tender documents, can be obtained from the Branch (Lacon House, Theobalds Road, W.C.1).

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KEITH BLACKMAN FANS AT OLYMPIA.—At the Engineering, Marine, Welding, & Nuclear Energy Exhibition at Olympia, London, on April 16-30, Keith Blackman Limited will display many examples from their range of Tornado fans, both centrifugal and axial types, for heating and ventilating applications, for air conditioning plant, and for mine ventilation, in sizes up to 70 in. dia. There will also be shown marine fans designed for ease of maintenance. Most direct-driven fans will have motors also made by Keith Blackman Limited. In addition, equipment relative to clean air and dust extraction, and a four-way welding-fume exhaust unit will be displayed.

# Staff and Labour Matters

### Railway Pay Claim

The three railway trade unions, N.U.R., A.S.L.E. & F. and T.S.S.A., met on Thursday, March 26, to discuss the claim which the executive of the N.U.R. has decided, following strong representations from its district councils and branches, should be lodged with the British Transport Commission for a substantial increase in pay for all their members in the employ of the Commission.

At time of going to press the attitudes of A.S.L.E. & F. and T.S.S.A. to the N.U.R. proposal are unknown.

### N.U.R. Withdrawal from Railway Consultative Machinery

The N.U.R. has informed the British Transport Commission that, as from the end of June, it intends to withdraw from the consultative procedure, which is part of the agreed machinery of negotiation for British Railways salaried and conciliation staff, a revised scheme of which was entered into by the three railway trade unions with the Commission in May, 1956. This action has been taken by the N.U.R. because the Commission has refused a request from the union for introduction of the "closed shop" principle for all railway employees.

The Chairman of the Commission in replying to the N.U.R. letter withdrawing from the consultative procedure, states the Commission has been astonished to learn of the decision of the union's executive and deplores it.

Sir Brian Robertson goes on to say:—

"At our meeting in November last I stated quite frankly our position in the matter of compulsory trade union membership. Your executive know that on many occasions I have gone out of my way publicly to acknowledge the help I have received from the unions, and the importance which I attach to their co-operation. The Commission have from the outset safeguarded in full the special position of the three railway unions so far as their negotiating rights are concerned.

"Moreover, the consultative procedure between management and staff forms part of the Memorandum of Agreement dated May 28, 1956, between the Commission and your union, the Associated Society of Locomotive Engineers & Firemen and the Transport Salaried Staffs' Association, which agreement can only be terminated, in accordance with the provisions of paragraph 21, by the Commission or by the three unions jointly giving 12 months' previous notice in writing to this effect. According to the advice given to me, the provisions relating to consultation must remain in force until the agreement is terminated by the above procedure.

"British Railways are going through a major crisis in their history. While they can and should surmount this crisis successfully, neither the management nor the representatives of the staff should close their eyes to the fact of the crisis. The basic objective of both is the future prosperity of the industry. Whatever differences they may have, neither side should do anything to undermine public confidence, nor to imperil the future of the industry. Co-operation and fruitful consultation cannot be enforced by agreement but I hope that these wider considerations will influence your executive to reconsider their decision."

It is understood the matter was due to be discussed by the three railway trade unions on March 26 when they met to discuss the N.U.R. wage claim.

# Notes and News

**B.I.C.C. Cambridge Branch Office.**—The address of the Cambridge branch office of British Insulated Callender's Cables Limited will be altered on March 31 to 65, Devonshire Road. The telephone number remains as before, Cambridge 55451/2.

**Road Casualties in January.**—Accidents on the roads of Great Britain last January caused 381 deaths, 89 fewer than in January, 1958. The total of 22,441 accidents was 2,700—or nearly 14 per cent—more than in January, 1958. It is estimated by the Road Research Laboratory that traffic on main roads had increased by about 8 per cent.

**New Sign for Waterloo Station.**—The accompanying illustration shows the new three-dimensional illuminated 48-sheet advertisement recently installed at Waterloo Station, British Railways, Southern Region. The site has been leased from

*Three-dimensional illuminated advertisement at Waterloo Station*

British Transport Advertising by the National Coal Board, to promote the use of Phurnacite fuel. The sign was designed, constructed, and installed by the Partington Advertising Co. Ltd. The electrical contractors were Neoflo Signs Limited.

**New Staff Amenities at Wath Marshalling Yard Completed.**—The staff amenities at Wath Marshalling Yard, British Railways, Eastern Region, have been improved by the recent completion of four new buildings. These are situated at Elsecar Junction, Turntable Lobby, and at "A" and "B" humps. The largest of the four is that at Elsecar Junction. This includes a messroom seating 22 persons, with a kitchen adjacent, a drying room, shunters' and inspectors' rooms and toilets. There are also operating, permanent way, oil, lamp and salt stores, and a Carriage & Wagon fitters' workshop. The building at Turntable Lobby has a central lobby and a messroom for 18 persons. It also includes electrical, brake van equipment, permanent way, oil, and lamp stores. At the humps the two buildings are similar and accommodate 10 staff in a combined locker room and messroom, with a small kitchen, lobby, and cycle store. The buildings were designed by Mr. H. H. Powell, Regional Architect, under the general direction of Mr. A. K. Terris, Chief Civil Engineer, Eastern Region. The main contractor was J. Dixon (Doncaster) Limited.

**Description of Travolator for Waterloo & City Line Passengers.**—The Southern Region of British Railways has produced a 12-page booklet, which has been handed out to passengers on the Waterloo & City Line, describing the 300-ft. long Travolator now being installed at Bank Station. The Travolator, a moving pavement, will carry passengers between the booking hall and platforms in 2 min. The twin-track Travolator will be in operation by the end of August next year.

**Express Motorcoach Services on Motorway.**—The Birmingham & Midland Motor Omnibus ("Midland Red") Co. Ltd. is to operate the first motorcoach service on a motorway in Britain. Giving a reserved decision on March 20, the West Midlands Traffic Commissioners granted permission for the service when the motorway opens in the autumn. There will be three trips each way daily between the Digbeth Coach Station in Birmingham and the Victoria Coach Station in London. The journey time is to be 3 hr. 25 min.

**British Waterways Pleasure Craft Display.**—A "see for yourself" display of pleasure craft is to be held by British Waterways at Paddington Canal Basin, Warwick Crescent, London, on April 20-25. Examples of canal cruising vessels, day cruisers, hire cruisers and inspection craft will be on view. The display will be floodlit each evening. It will be open to the public from 2.30 to 9 p.m., Monday to Friday, and from 11 a.m. to 9 p.m. on the Saturday. Admission will be free.

**London-Paris Rail-Air Service.**—Starting on June 15, British Railways, Southern Region, Silver City Airways Limited, and the French National Railways will operate a rail-air-rail service, the "Silver Arrow," between London and Paris. Travel will be by multiple-unit electric train between Victoria and Margate, special bus between Margate Station and Manston airfield, 30-min. flight by Hermes four-engined aircraft to Le Touquet airfield, bus to Etaples Station, and special multiple-unit diesel train between Etaples and Paris Nord. Journey time in each direction will be about 7 hr. The return fare is £8 19s. Construction is being examined of rail links with Manston and Le Touquet airfields.

**"Day-Line Diesel" Tickets in North Eastern Region.**—British Railways, North Eastern Region, is now issuing "Day-Line Diesel" tickets. These tickets were introduced last season, and are on sale again until the end of October. "Day-Line Diesel" tickets are also available for travel on steam and electric services as well. They cover two areas. The "Northern Section" stretching from Alnwick to Whitby Town, along the Tyne Valley from Newcastle to Carlisle, and South to Darlington via Penrith over the Stainmore Summit, includes Newcastle, Darlington, Middlesbrough, and Barnard Castle. The "Southern Section" covers West Riding towns such as Huddersfield, Bradford, and Leeds, and the Yorkshire Coast from Whitby Town in the North to Scarborough, Filey, Bridlington, and Withernsea. The ticket costs 16s. 6d. during the period July 6 to August 30, but outside this period a reduced charge of 15s. will apply. A souvenir medallion is issued with each ticket.

**British Transport Commission to Sell Two Ships.**—The British Transport Commission is to offer for sale two of its cargo vessels, the *Hebble*, of 1,078 tons, built in 1924, and the 1,122 tons *Blyth*, built in 1931. Both vessels have accommodation for eight passengers and were operated by Associated Humber Lines Limited on North Sea services. The ships are surplus to requirements as a result of the modernisation of Associated Humber Lines fleet which is now in progress. The *Hebble* will be available for sale from about April 1, and the *Blyth* from about April 25.

**Withdrawal of Passenger Services from Holme and Yaxley & Farcet Stations.**—British Railways, Eastern Region, announce that the passenger train service will be withdrawn on April 6 from Holme and Yaxley & Farcet Stations, on the Great Northern main line south of Peterborough. Holme passengers will be catered for at Peterborough North and Huntingdon North, and Yaxley & Farcet passengers at Peterborough North. Bus services operate in the area served by both stations. Facilities for the collection, delivery, and despatch of parcels will continue to be available at both stations.

**Explaining Delays on the Cambridge Line.**—Mr. H. W. Few, Great Eastern Line Traffic Manager, British Railways, Eastern Region, has circulated a news letter to passengers travelling on the Liverpool Street - Cambridge Line in which he explains the reasons for the poor punctuality experienced during the recent winter. They fell into five main groups. Speed restrictions caused by electrification work are, he states, by far the biggest single direct or indirect cause of delay. Punctuality should improve during the summer, but substantial improvements between London and Bishops Stortford cannot be expected until the line is electrified in just over a year's time.

**Diesel Excursion for Photographers.**—A special excursion train to Betws-y-Coed in North Wales will be run on June 7 by British Railways, Eastern Region, for amateur photographers resident in the South Yorkshire area. It will start from Doncaster and will call to pick up at Sheffield Victoria and elsewhere. A multiple-unit diesel train will be used so that passengers will have the best possible view. A competition has been arranged by British Railways, open to all amateur photographers on the excursion, and cash prizes will be awarded for the six best photographs submitted. Entries will be judged by a panel appointed by the Public Relations & Publicity Officer of the Eastern Region.

**British Standard for Railway Spring Steels.**—The new British Standard publication, Laminated springs and spring steels for railway rolling stock materials (B.S. 24, Part 3A : 1959) completes the revision of B.S. 24, Railway rolling stock materials. The standards conform generally to the requirements of the British Transport Commission, although the Commission's internal standards vary to a small extent from those issued by the B.S.I. B.S. 24, Part 3B, dealing with helical and volute

springs and spring steels, was published in three Sections in 1955. Copies of Part 3A, price 7s. 6d., may be obtained from the British Standards Institution, 2, Park Street, London, W.1.

**British Standard for Cable Sealing Boxes.**—The new British Standard publication, B.S. 2562, Part 2:1959, Boxes for 22 kV. and 33kV. solid-type cables, gives details of seven cable boxes for use indoors and outdoors. As with Part 1, issued in 1955, which dealt with voltages up to and including 11 kV., the standard is applicable mainly to boxes for lead-covered cables; but account is taken of the use of cables with an aluminium sheath. Each box is completely identified by a shell number. Copies, price 8s. 6d., may be obtained from the British Standards Institution, 2, Park Street, London, W.1.

**North Eastern Region Easter Train Services.**—British Railways, North Eastern Region, is running 529 additional trains during the Easter period. Of these, 383 are relief trains and 146 excursion trains. Of the relief trains, 173 will originate in the Region, 157 will run into and terminate within the Region, and 53 will pass through but serve stations within the Region. Seats will be reservable on 126 of the relief trains and restaurant or cafeteria facilities will be available on 34. A Sunday service of trains is operating today (Friday) with certain relief trains, whilst on March 29 there will be a modified Sunday service. On Easter Monday and Tuesday, an augmented weekday service will operate, although various morning business trains will be cancelled.

**New Overline Bridge at Ellesmere Port.**—Mr. Harold Watkinson, The Minister of Transport & Civil Aviation, has made a grant of £100,125 to the Cheshire County Council towards the cost of building a three-span bridge to carry Station Road, Ellesmere Port (A.5032), over the Hooton-Helsby branch line of British Railways. The total cost of the project is £133,500. The railway line separates the factory area from residential areas, and the only direct connection at present is by way of a level crossing and a narrow vehicular subway, which was originally a cattle-creep. The new bridge and approaches will relieve the traffic congestion caused by the increasing industrial development of the neighbourhood. The scheme has been prepared by Mr. C. G. Day, County Surveyor and Bridgemaster of Cheshire.

**Railway Students' Association Golden Jubilee Celebrations.**—The programme of celebrations in London of the jubilee of the Railway Students' Association, London School of Economics & Political Science, includes, on April 3, visits to the new signalbox, relay room, power substation and District Control Room at St. Pancras, and to Stonebridge Park carriage cleaning and servicing depot, Willesden, in the London Midland Region. A reception will be held at the London School of Economics by the Director, Sir Sydney Caine, followed by a dinner at the School at the invitation of the Governors. On April 4 a paper on modernisation of British Railways will be read by Major-General Ll. Wansbrough-Jones, Secretary General, British Transport Commission. Visits will be paid to Temple Mills marshalling yard, Eastern Region, and to Stewart's Lane depot, Southern Region, new carriage shed for electric stock Kent Coast services, and to the locomotive shed in course of conversion from steam to diesel-electric use. On Sunday, April 5, there will be an excursion by motorcoach to London Airport and Windsor. The L.T.E. signalbox and car-servicing depot at Upminster will be visited on April 6, and the Eastern Region training School at Ilford. A reception will be held at the Chatham Rooms, Victoria Station, by Mr. A. B. B. Valentine, President of the Railway Students' Association, and Member of the B.T.C., followed by the Fiftieth Anniversary Dinner of the Railway Students' Association. On April 7 there will be a choice of visits to various signalling and electric traction installations of the Southern Region in the London area, followed by luncheon at the Chatham Rooms, Victoria.

**Western Region Rail and Steamer Plans for Easter Holidays.**—British Railways, Western Region, is running nearly 300 special long-distance Easter Holiday trains. Also there will be a number of alterations to the normal service on March 28 and Easter Sunday, March 29. To cater for returning travellers, 102 additional expresses will be provided on Easter Monday. Cheap fare facilities are available for various sporting events. An excursion from Paddington and Ealing Broadway to Oxford, including a conducted tour of the Colleges, will be run on Easter Monday. The sailing from Fishguard to Waterford on the night of Good Friday, and from Waterford to Fishguard on March 28, will be cancelled. Advertised sailings will be maintained between Fishguard and Rosslare, Fishguard and Cork direct steamer, and between Weymouth and the Channel Islands.

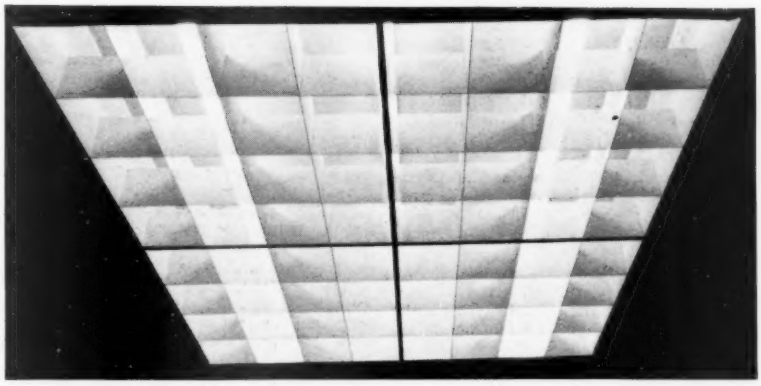
## Forthcoming Meetings

March 31 (*Tue.*) to April 4 (*Sat.*).—Model Railway Club Exhibition, at the Central Hall, Westminster, S.W.1. Noon to 9.30 p.m. first day, remainder of week 10.30 a.m. to 9.30 p.m.

April 1 (*Wed.*).—Electric Railway Society, at the Fred Tallant Hall, 153, Drummond Street, London, N.W.1, at 7.15 p.m. Paper on "Railway electrification In India," by Mr. G. W. Launder.

## New Features at Notting Hill Underground Station

(*See pages 272-274 of our March 6 issue*)



*Fluorescent-lighting fitments hide wiring in metallic casing which forms part of overall design*

*Aluminium grille screening opening to pressure relief tunnel*

April 3 (*Fri.*).—The Railway Club, at the Royal Scottish Corporation, Fetter Lane, London, E.C.4, at 7 p.m. Paper on "The railways of Wales, 1899-1959," by Mr. D. S. M. Barrie.

April 3 (*Fri.*) to April 6 (*Mon.*).—Railway Students' Association Golden Jubilee Celebrations.

April 7 (*Tue.*).—Permanent Way Institution, Leeds & Bradford Section, in the British Railways Social & Recreational Club, Ellis Court, Leeds City Station, at 7 p.m. Paper on "Railway weed control," by Mr. G. G. Fisher of the Chesterford Park Research Station.

April 8 (*Wed.*).—Permanent Way Institution, London Section, at the Headquarters of the British Transport Commission, 222, Marylebone Road, London, N.W.1, at 6.30 p.m. Paper on "Drainage and stabilisation of track, cuttings and embankments on the German Federal Railways," by Herr A. Bethauser, Dipl.Ing., Deutsche Bundesbahn.

April 9 (*Thu.*).—Institution of Railway Signal Engineers, at the Federation of British Industries, 21, Tothill Street, London, S.W.1, at 7 p.m. Annual general meeting.

April 10 (*Fri.*).—British Railways, Western Region, London Lecture & Debating Society, in the Headquarters Staff Dining Club, Bishop's Bridge Road, Paddington, W.2, at 5.45 p.m. Debate with the Federation of Railway Lecture & Debating Society, North Eastern Region: "That the organisation and methods of British Railways are unnecessarily elaborate."

April 10 (*Fri.*).—Stephenson Locomotive Society, Scottish Area, at 25, Charlotte Square, Edinburgh, at 7 p.m. Paper on "Some thoughts on the products of Swindon," by Mr. A. F. Cook.

April 10 (*Fri.*).—Railway Correspondence & Travel Society, Sussex & Kent Branch, at the Railway Hotel, Brighton, at 7 p.m. Paper on "The new Temple Mills Yard," by Mr. R. Kirkby.

April 11 (*Sat.*).—The Stephenson Locomotive Society, Scottish Area, at 302, Buchanan Street, Glasgow, at 2.30 p.m. Paper on "Some thoughts on the products of Swindon," by Mr. A. F. Cook.

April 11 (*Sat.*).—The Stephenson Locomotive Society, North Western Area, in the Conference Room, Liverpool Central Station, at 7.30 p.m. Paper on "Locomotives at Cambridge, 1909-1914: the end of an era," by Mr. E. M. S. Wood.

April 11 (*Sat.*).—Railway Correspondence & Travel Society, South of England Branch, at the Y.M.C.A., Friar Street, Reading, at 6 p.m. Paper on "Dougald Drummond, the man and his work," by Mr. T. Clyde Britten.

April 11 (*Sat.*).—Permanent Way Institution, Leeds & Bradford Section. Visit of Irish Section to Leeds for joint meeting.

April 13 (*Mon.*).—Institute of Transport, at the Jarvis Hall (R.I.B.A.), 66, Portland Street, London, W.1, at 5.45 p.m. Brancker Memorial Lecture. "World peace through air transportation," by Captain E. V. Rickenbacker, Chairman of the Board, Eastern Air Lines, Inc.

April 13 (*Mon.*).—The Railway Club, at 320, High Holborn, London, W.C.1, at 7 p.m. Talks by Mr. N. McCracken and Mr. E. J. T. G. Bagshawe.

April 14 (*Tue*).—Permanent Way Institution, York Section, in the Railway Institute, York, at 6.45 p.m. Paper on "Snow Clearances," by Mr. J. M. Hauer, Netherlands Railways.

April 15 (*Wed.*).—Institution of Railway Signal Engineers, Manchester Section, at the Dining Club, Hunt's Bank, Manchester, at 6.30 p.m. Paper on "Colour-light signalling principles, including the application of C.T.C.," by Mr. D. G. Parker.

April 16 (*Thu.*).—Diesel Engineers & Users Association, at the Connaught Rooms, London, W.C.2. Annual luncheon.

April 16 (*Thu.*).—Model Railway Club, at Caxton Hall, Westminster, S.W.1, at 7.45 p.m. "Joint effort: The Story of a layout (Part 2)," a talk by Mr. P. D. McCann and Mr. H. Boucher.

April 17 (*Fri.*).—Railway Correspondence & Travel Society, London Branch, at the Railway Clearing House, Eversholt Street, N.W.1, at 7.15 p.m. Paper on "Dieselisation on the Western Region," by Mr. W. A. R. Creighton, Assistant Mechanical & Electrical Engineer, Western Region, Swindon.

## Railway Stock Market

Stock markets have responded afresh to expectations of tax reductions in the coming Budget and to the encouraging views which have gained ground in the City about the general election outlook. British Funds were firmer, and, in particular, steel shares moved strongly ahead because of hopes of a Conservative victory when the election comes. There was not much business passing in foreign rails. Antofagasta ordinary stock, after a sharp reaction, rallied, but at 12 compared with 12½ a week ago, while the preference stock lost two points at 25. The 4 per cent perpetual debentures of that company were 36, and the 5 per cent (Bolivia) debentures 87½.

Costa Rica Railway ordinary stock was 13½ and the 6½ per cent second debentures 87½. Paraguay Central prior debentures continued to be quoted at 12. Chilean Northern 5 per cent debentures were 55. Elsewhere, Brazil Railway bonds changed hands up to 7. United of Havana second income stock kept at 6 while elsewhere, Mexican Central "A" bearer debentures strengthened afresh to 80½.

Canadian Pacifics at $55¾ were virtually the same as a week ago, the 4 per cent preference stock strengthened to 54½ and the 4 per cent debentures to 65⅛. White Pass shares were again around $13¾.

West of India Portuguese capital stock held firm at 105½ with the 5 per cent debentures 91½. There was more business in Nyasaland Railways shares, which, however, eased further to 12s. 9d.; the 3½ per cent debentures were 61½.

Among shares of engineering and locomotive builders, the outstanding feature has been an advance in Birmingham Wagon from 17s. a week ago to 21s. 4½d. in response to the results which were well in excess of anticipations. North British locomotive, however, remained depressed at 10s. At 7s. 10½d., Beyer Peacock 5s. shares were little changed compared with a week ago, but a good feature has been a further rise in Charles Roberts 5s. shares to 10s. 9d. Elsewhere, Gloucester Wagon 10s. shares strengthened to 18s. xd. but Wagon Repairs 5s. shares eased to 9s. 4½d. G. D. Peters changed hands around 26s.

English Electric shares strengthened to 65s. 6d. under the influence of Sir George Nelson's review at the annual meeting, which emphasised the group's varied activities and the progressive policy being followed. His remarks imply that profit margins are narrowing and that, as in most industries these days, there is extremely keen competition to expand turnover. Associated Electrical were 55s. 3d. and General Electric 31s. 6d. Crompton Parkinson 5s. shares changed hands around 13s. John Brown remained around 32s. with the new shares 2s. 9d. premium. Ruston & Hornsby at 27s. were also well maintained. The 10s. shares of the Dowty Group changed hands around 41s. 3d. with the new shares 4s. 6d. premium over the issue price of 36s. 6d. Pressed Steel 5s. shares were firm at 26s. 1½d.

In other directions, T. W. Ward have strengthened to 83s. 9d. and Vickers were better at 31s. 10½d. while British Timken rose further to 65s. on hopes of higher dividend prospects. Federated Foundries shares remained active on further consideration of the results and were 34s. 6d. Stone-Platt Industries shares have been firm at 44s. 7½d. and Guest Keen gained 9d. at 53s. 3d. Among steels, United Steel and Stewarts and Lloyds were particularly good, both having risen to over 29s. The prevailing City view is that if the general election kills the possibility of re-nationalisation, steel shares would be worth up to 10s. over current prices, and that with the threat of re-nationalisation removed, many steel companies would go ahead with plans for raising additional capital, which would probably be raised mainly by issues to shareholders on attractive terms.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Send postcard before 13th April, 1959, mentioning the post and this paper for further particulars and application form to: The London Representative, Nigerian Railway Corporation, Nigeria House, 9 Northumberland Avenue, London, W.C.2.

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